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PREFACE TO VOL. V.

This, the fifth volume of the Report of the Natural History Results of the Voyage of the S.S. 'Discovery' sent in 1901 to the Antarctic Regions under Captain R. F. Scott, R.N., contains five reports on Animals and one on the Lichens collected by the Officers of the Expedition, and has been edited by Mr. Jeffrey Bell.

It is hoped that another volume, treating of the Polyzoa, Polychæta, Radiolaria, Fresh Water Algæ and, possibly, some isolated specimens, will conclude these Reports, which, taking everything into consideration, may be said to have been produced more rapidly than such Reports generally are.

Sidney F. Harmer,
Keeper of Zoology.

British Museum (Natural History).
January 17*th*, 1910.

SUMMARY OF THE
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CONTAINING THE REPORTS ON ZOOLOGY AND BOTANY SO FAR AS PUBLISHED.

ECHINODERMA.

SIPUNCULOIDEA.

MYZOSTOMIDÆ.

CHÆTOGNATHA.

NEMATODA.

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CESTODA.

CŒLENTERA.

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CRUSTACEA.

IX. ISOPODA.

By T. V. Hodgson, F.L.S.

(10 Plates.)

The collection of Isopoda brought from the Antarctic by the 'Discovery,' if not a large one, possesses no small degree of interest.

No less than twenty-five species were captured, and, with a few exceptions, these are not very numerous in individuals, in fact the number of species represented by a single specimen or by only two or three is unduly large. The labour involved in collecting in an ice-covered area was the only serious difficulty to contend with; of course the ice sheet reduced very considerably the area of operations, open water and a boat would have enormously increased the collections, and though the 'Discovery' was in Winter Quarters six weeks before the sea was effectively closed, that was a busy period, and it was only at intervals that a boat's crew could be obtained.

Another cause which operated against big collections was, in my opinion, the immense numbers of the Amphipod *Orchomenopsis rossi* which swarmed into the traps, devouring the bait, and sometimes the specimens captured, and which were themselves captured ten to thirty thousand at a time.

I have, I think, satisfactorily proved that *Serolis cornutus* Studer, is merely the immature form of *S. trilobitoides* Eights. The specimens captured by the 'Discovery' are not fully grown, but they are sufficiently so to show all the essential features described by that keen observer, Eights. Dr. Studer's specimens, as well as those described by Mr. Beddard, are much smaller and obviously far from mature. I do not think there can be any further doubt on this question.

No less than seven of the species described in the 'Southern Cross' Report have been found again, one in the same locality, the others with a much extended range, passing, in some cases, to the opposite side of the southern hemisphere.

The Arcturidæ is another family in which specific characters become seriously involved in sexual variation. The male and female of one species, *Antarcturus franklini*, appear on Pl. V. as two species, the male being there indicated under the name *A. australis*. It was only when all the specimens of both sexes, or as it was then thought to be, both species, came to be overhauled that the error was noticed. I am not aware of any such distinct case of sexual variation in other members of the genus, but that it occurs to a less extent is perfectly well known. The only species other than *Serolis trilobitoides* Eights, which was taken close to the Antarctic Circle, just as we were leaving those regions, that can be considered large is *Glyptonotus acutus*

Richardson. We were certainly unfortunate in not capturing a greater number of specimens. The small species belonging to the Janiridæ, Munnidæ and their allies were very abundant and much time was spent in going over the sponge débris, which was invariably the predominent feature in the shallow water fauna; they were taken for the most part by the D-net inside the 25-fathom line, and it is among these forms that the chief interest in the collection lies. Seven species, mostly assigned to new genera, have their eyes on enormous peduncles. This, I believe, to be an entirely new feature. In dealing with the Isopoda of the French Antarctic Expedition (12) Miss Richardson has introduced two species possessing this interesting feature to science; the 'Discovery' adds five more, and among those specimens the ocular peduncle is even more slender and elongated. Under these circumstances can the Isopoda be regarded as universally sessile-eyed? Up to the present it has been so, and the Munnidæ have been considered to be on the way to a different state of things. Among that family it is a very moot point whether the eye can be said to be on a peduncle at all, as the cephalic process is so large, but now these new southern forms show a long and slender peduncle quite on a par with those of the podophthalmous crustacea, which reduces the value of a hitherto characteristic feature of this group to a minimum, and the existence of a joint has only to be proved to destroy it altogether.

I here append a list, as far as I have been able to ascertain, of all Isopoda hitherto obtained in the Antarctic regions; several of these are as yet little more than mere names to me. Those taken by the 'Discovery' are marked with *. The total number is one hundred and eleven, of which twenty-nine belong exclusively to the Antarctic, seven more belong to both the Arctic and sub-Antarctic regions, and the remaining seventy-five exclusively to the latter. As stated in my Report on the 'Discovery' Pycnogonida, I take the northern limit of the sub-Antarctic region to be the mean annual isotherm of the surface water of 45° F., as defined by Buchan in the concluding volume of the 'Challenger' Reports, and the latitude 60° S. as the boundary between the sub-Antarctic and the Antarctic regions proper. I have, however, gone a step further in dealing with some Pycnogonids from the Magellan Straits. I then found it desirable to define a Magellan region, and therefore divided the entire Antarctic into three provinces, naming them from their points of attack, it being obvious that any visit to the South Polar regions would be made from the land masses to which these names refer, Kerguelen, of course, standing for Africa.

In accordance with the above I have noted the province from which each species has been taken:—

Australasian province between long. 100° E. and long. 130° W.
Kerguelen province between long. 100° E. and long. 20° W.
Magellan province between long. 20° W. and long. 130° W.

It may reasonably be objected that these boundaries are purely artificial, and that

it would have been more appropriate to make the provinces coincide with the oceans to the north. It may be so, but it seems to me to name the provinces from the point of attack is the wisest course in the present state of our knowledge. The more I see of the South Polar fauna the more certain I become that a very large proportion of species have a circumpolar distribution. It would also appear that the northwardly projecting spur of Graham's Land, which passes for some considerable distance beyond the Antarctic circle, constitutes a barrier round which species have a difficulty in passing. Whether the South Polar fauna originated in those latitudes and has spread northwards, or whether it has acquired its present aspect by migration from the north, is a speculation which will be material for discussion for many years to come. Be this as it may, our greatest knowledge will lie nearest to the three points of attack, and from these it will be comparatively simple to investigate the passage of various species northwards into the great oceans. A circumpolar fauna will specialise more or less distinctly as it passes northwards, and its ancestors or other relations become separated by the great land masses. Or, if investigation shows the migration to be in a southerly direction, we have in those oceans three independent streets down which the fauna passes to mix beyond their junctions, or to pass on to the uttermost limit where uniform conditions, within certain limits, must have their effect.

The collection brought back by the 'Français' from the west coast of Graham's Land is very like that of the 'Discovery,' no less than eight species are common to both, their total number being thirteen.

The collection of the 'Scotia' is still in my hands for description, the shallow water and littoral forms come from a more northerly latitude, the South Orkneys, the deep sea forms from the Weddell Sea. I can only say here that this collection does not contain a single species taken by the 'Discovery.' Three other Antarctic collections remain to be described; how far they will bear out the opinion expressed above remains to be seen.

	Antarctic.	Sub-Antarctic.
Apseudes antarctica Beddard		×
„ spectabilis Studer		×
Tanais willemoesi Studer		×
„ hirsutus Beddard		×
Typhlotanais kerguelenensis Beddard		×
Leptognathia australis Beddard		×
Nototanais dimorphus Beddard		×
* „ antarcticus Hodgson	×	
Paranthura neglecta Beddard		×
* Leptanthura glacialis	×	
* Gnathia antarctica Studer	×	×
„ tuberculosa Beddard		×
* Enneognathia gigas Beddard	×	×
Ægathoa magnifica Dana		×
„ semicarinata Miers		×
„ punctulata Miers		×
„ edwardsi Dollfus		×

	Antarctic.	Sub-Antarctic.
* Ægа antarctica n. n.	×	
* Cirolana meridionalis	×	
Rocinela australis Schiödte and Meinert		×
Anilocra laticauda Milne Edwards		×
Serolis paradoxa Fabr.		×
* „ trilobitoides Eights	×	×
„ plana Dana		×
„ convexa Cunningham		×
„ schythei Lutken		×
„ latifrons White		×
„ septemcarinata White		×
„ serrei Lucas		×
„ bromleyana Suhm		×
„ antarctica Beddard	×	
„ pagenstecheri Pfeffer		×
„ polita Pfeffer		×
„ bouvieri Richardson	×	
Exosphæroma gigas Leach		×
„ lanceolatum White		×
„ calcareum Dana		×
Dynamenella globicauda Dana		×
„ eatoni Miers		×
* Cymodocella tubicauda Pfeffer	×	×
Dynamene (?) darwini Cunningham		×
Cassidinopsis emarginata Guer-Men.		×
Cymodocea australis Hodgson	×	
Plakarthrium punctatissimum Pfeffer		×
Limnoria antarctica Pfeffer		×
Arcturus furcatus Studer	×	×
„ glacialis Beddard	×	
„ spinosus Beddard		×
„ brunneus Beddard		×
„ studeri Beddard		×
„ americanus Beddard		×
„ stebbingi Beddard		×
„ coppingeri Studer		×
„ polaris Hodgson	×	
* „ adareanus Hodgson	×	
* „ franklini Hodgson	×	
* „ hiemalis	×	
* „ meridionalis	×	
Astacilla marionensis Beddard		×
„ falklandica Ohlin		×
„ magellanica Ohlin		×
Glyptonotus antarcticus Eights	×	
* „ acutus Richardson	×	
Arcturides cornutus Studer		×
Macrocheiridothea michælseni Ohlin		×
„ stebbingi Ohlin		×
Idotea annulata Dana		×
„ rotundicauda Miers		×

	Antarctic.	Sub-Antarctic.
Idotea metallica Bosc.		×
„ miersii Studer		×
Edotia tuberculata Guer-Men.		×
„ magellanica Cunningham		×
„ lilljeborgi Ohlin		×
Cleantis granulosa Heller		×
Notasellus sarsi Pfeffer		×
* „ australis Hodgson	×	
Jæropsis marionis Beddard		×
* Austronanus glacialis	×	
* Austrofilius furcatus	×	
Jæra antarctica Pfeffer		×
Jais pubescens Dana		×
„ hargeri Bovallius		×
Ectias turqueti Richardson	×	
Iolanthe acanthonotus Beddard	×	
* Coulmannia australis	×	
* „ frigida	×	
* Notoxenus spinifer	×	
Munna maculata Beddard		×
„ pallida Beddard		×
* Haliacris antarctica Pfeffer		×
Austromunna antarctica Richardson	×	
* „ rostrata	×	
* Antias charcoti Richardson	×	
Pleurogonium albidum Beddard		×
„ serratum Beddard		×
* Austrosignum grande	×	
* „ glaciale	×	
Neasellus kerguelenensis Beddard		×
Astrurus crucicauda Beddard		×
Munnopsis australis Beddard		×
Eurycope sarsi Beddard		×
„ fragilis Beddard	×	×
„ spinosa Beddard		×
Echinozone spinoza Hodgson	×	
Ilyarachna quadrispinosa Beddard		×
* Notopais spicatus	×	
Acanthocope spinicauda Beddard		×
Tylos spinulosus Dana		×
Porcellio fuegiensis Dana		×
Oniscus augustus Dana		×
Styloniscus magellanicus Dana		×

NOTOTANAIS.

Nototanais Richardson (**12**), pp. 1 & 2.

This genus has been defined by Miss Richardson as follows :—

First pair of antennæ composed of three joints in the female, and five joints in the male.

Second pair of antennæ composed of five joints in both sexes.
Cephalon of the male large at the base, and prolonged anteriorly to a narrow extremity.
Cephalon united to the first thoracic segment, leaving six segments well developed.
Uropoda biramous, each branch composed of two joints.
The first gnathopods are dissimilar in the two sexes. In the male they are much enlarged, and the propodite is furnished with a process directed backwards, a thumb, which forms a chelate hand.

This genus has been instituted for the reception of *Paratanais dimorphus* Beddard (**1**), and *P. antarcticus* Hodgson (**7**), which, on account of their strongly marked sexual dimorphism, a character they share with *Heterotanais* G. O. Sars, and other minor features, can no longer be included in any existing genus.

Nototanais antarcticus.

Paratanais antarcticus Hodgson (**8**), pp. 240 & 241.
Nototanais antarcticus Richardson (**12**), pp. 2 & 3.

Body rather slender, but differing in its proportions in the two sexes, being rather longer in the female, notwithstanding the fact that the cephalosome is much longer in the male than in the female.

Male.—The cephalosome is pyriform, long, narrowest anteriorly ; this border being obtusely angulated, and having a well-marked conical projection laterally which is occupied by the eye. This cephalosome is a little longer than the first four free segments of the mesosome.

The mesosome comprises six segments ; the first is very short, and the next three progressively increase in length, the two following decrease, the last being nearly as long as the third.

The metasome is six-jointed, five of the segments being subequal in size, the last is twice as long and rounded, bearing the biramous uropoda postero-laterally.

Female.—The cephalosome is shorter and more distinctly conical than pyriform, and is not longer than the first three free thoracic segments. The proportions of these segments are similar to those of the male, though they are longer, the length of the mesosome in male and female being as 9 to 11.

First antenna. That of the male comprises five joints, of which the first is longer than the other four together, the proportion being as 6 to 4 ; the second is as long as the two terminal ones, the third being by a very little the shortest of the series. Except the penultimate all the joints bear a few long setæ distally ; the terminal joint has half-a-dozen or thereabouts. In the female this organ is tri-articulate, the first joint being nearly twice the length of the other two together. There are a few long setæ distally and in the middle of the first joint.

The second antenna in the female has five joints: the first is short, the next two are a little longer and subequal, the fourth is very nearly as long as these three together, the terminal one is about as long as the second or third, but of course a great deal more slender. This one terminates in a group of six long setæ; setæ occur distally on all the joints except the first.

In the female the mandible is strong, the cutting edge is incurved almost to a right angle and armed with three large teeth, a broad one behind the other two. The molar tubercle is long, at right angles to the main structure; it is slightly swollen and then tapers to its posterior border. This edge bears five well-developed teeth and a discoloured tubercle within this on the posterior border. The mandible of the opposite side has a well-developed cutting edge with a prominent tubercle posteriorly, but there are no long teeth here. There is no palp.

The first maxilla has a broad base, the external margin rapidly tapering to a slender band-like structure. It is much curved inwards distally, and armed with some half-dozen strong teeth, one of which, the most external, is longer than the rest. The so-called palp rises from the inner margin of the base, and is a slender structure about two-thirds the length of the main lobe, and terminating in two long setæ.

The second maxilla is only represented by a small ovoid lobe.

The maxillipeds together have a median, heart-shaped basal joint, which is divided longitudinally; the masticatory lobe is more than half the length of the basal joint, slightly increasing in diameter to the end, which is truncate, armed with a couple of small tubercles and quite devoid of any setæ.

The palp is five-jointed. The first joint is very small, the second is the longest with an oblique distal margin, the third is triangular in shape, the apex external, and therefore this side of the joint is reduced to a minimum; the fourth joint is large, and the terminal about half the length and much more slender; this is armed with four long setæ.

The epignath is about three-quarters the length of the basal joint and irregularly ovoid.

The first appendage of the mesosome, or chelipeds, of the adult male are very largely developed. The ischium is a broad joint prolonged below the point of its articulation to a broad, curved edge, like an axe-blade. The merus is a very short joint, wedged in obliquely between the ischium and the carpus. The carpus, excepting the dactylus, is the longest joint of the limb; it is very broad and rounded posteriorly. Its inner margin is produced into a knife edge. The propodus is a stout joint about half the length of the dactylus, and carries, on its inner side, at right angles to it, a large irregularly-shaped appendage which forms a chela with the dactylus. This appendage is curved; the proximal portion is broad, flattened, and produced into a stout spur, directed inwards. The distal portion is more slender, having a swelling with a few (three) long setæ on its inner side, beyond which it terminates in a slender incurved finger. The dactylus is very long, slender, and curved, longer than any other joint in the appendage.

In the female the first appendage of the mesosome is comparatively small; the ischium is produced as a rounded lobe, much narrower than that of the male, below the point of its articulation; the merus is not very different to that of the male; the carpus is cylindrical; both these joints bear a pair of long setæ. The propodus forms a well-developed chela; the two dactyli are stout and subequal in size, with discoloured teeth at their extremities. The immovable finger has a long seta on either side of its base and another pair on the inner margin close to a series of four small teeth which end against the terminal tooth.

In the female the first leg is slender, the first joint is as long as the succeeding four, the second is very short, and the others progressively lengthen and have a few setæ distally; the setæ are strongest at the extremity of the limb; the terminal claw is very slender and more than half the length of the joint which bears it. The two following legs are similar, but the terminal claw shortens. The last three pair are a little shorter and stouter, the setæ are more spinous, and the terminal claw is comparatively short and more definitely a claw. Those of the male are similar, but longer and more slender. The oostegites number four pairs, and are attached from the second to the fifth appendages of the mesosome. Each oostegite consists of a rather broad strap-like axis, from each side of which extends a very delicate membrane, the whole forming a concave structure nearly round in shape.

The pleopods are five pairs of the appendages adapted for respiration, and are similar in both sexes. Each consists of a protopodite of two joints, the first of which is very small, a large endopodite, ovoid in shape, the inner margin of which is fringed with stiff setæ, and these increase in size to the distal extremity. The exopodite is much smaller, slightly curved, and its inner margin is similarly setose, but the setæ are much reduced in number; the posterior pleopoda differ slightly in shape. The exopodite is attached half way along the second joint of the protopodite.

A very large number of specimens were collected during the whole of our stay in Winter Quarters. They were constantly being picked out of the sponge débris and obtained inside the 25-fathom line. It would appear from the great number of individuals of all ages and sizes that the acquisition by the male of the enormously developed chelipeds takes place suddenly. There were no specimens which indicate a gradual development of these organs, nor were there any specimens of small size showing this distinctly masculine character. A large proportion of the apparently adult females show no trace of oostegites, and it is quite possible that some at least were not completely developed males. The suddenness of the change is also emphasized by the fact that the mouth organs of the fully developed male are defective.

LEPTANTHURA.

Leptanthura G. O. Sars (**13**), pp. 47–48.

This genus was instituted by Prof. G. O. Sars in 1899, being separated from *Paranthura* by a number of small characters. The mouth organs seem to be the

essential features upon which this separation is based, but under any circumstances the two genera are very closely allied. The following species is most nearly related to *Leptanthura*.

Leptanthura glacialis.

(Plate I., fig. 1.)

Specific characters :—

Uropoda as long as the metasome, broad ; the exopodite rather less than half the length of the endopodite and cordate in shape.

This species attains a length of 21 mm.

The cephalosome is the smallest segment of the body, and its anterior margin is incurved to be produced in the middle line into a short point between the insertion of the antennæ. There are no eyes.

The mesosome comprises seven distinct segments, these are elongated, and the first is longer than the cephalon, the two following are very little longer and subequal, the two succeeding ones are a little longer still and subequal, the last is very little shorter than the first.

The metasome is narrower and all the segments are distinct. The first and fifth are rather the longest, the intermediate ones being subequal in size, the sixth is narrower and longer, having the posterior margin rounded.

The telson is elongate, linguiform tapering to a blunt point, which is setose. The uropods are large and with the telson form a conspicuous caudal fan.

The first antenna (fig. 1a) has a peduncle of three stout joints, progressively shortening from the first, the third only having a distal fringe of long setæ. The flagellum consists of four joints, the first being broad but extremely short, so much so as to be easily overlooked ; the next joint is comparatively long, the two terminals progressively shorten but are together half the size of the preceding one ; both, more particularly the terminal one, are provided with long setæ.

The second antenna (fig. 1b) comprises a peduncle of four very short joints ; of the first the inner margin is much swollen, the next joint is attached at an angle and has a rounded base, otherwise it is very short and stout ; the two following are subequal in length, but the more distal one, though still stout, is little more than half the diameter of the proximal one ; both are fringed distally with long setæ. The flagellum comprises five joints, the first is the largest, the other four are very small, all are fringed distally with long setæ, those of the terminal joint forming a dense tuft quite concealing all details as to the character of this joint.

The mandible is triangular, pointed, and bears a diminutive palp, in which I have only been able to discern two joints.

The maxilla (fig. 1c) is a single comparatively broad joint tapering to a fine point.

The maxilliped (fig. 1d) is elongated and has its inner edge straight, the outer one being rather rounded to the extremity. The masticatory lobe, such as it is, is represented only by a minute conical joint bearing a single seta, a small palp of a

single joint and about one-third the length of the entire appendage is present. Its apex is provided with a few long setæ. The epignath is very small and ovoid.

The appendages of the mesosome show a transition between the subchelate first and the more locomotive posterior ones. The first of these appendages (fig. 1e) is stoutly built, the basis is a little longer than the ischium. The merus is a peculiar joint and is short, very much expanded dorsally to embrace the base of the propodus; it bears several long setæ ventrally and two or three at the dorsal extremity.

The carpus is a small joint, on the inner side of the appendage, apparently wedged in between the merus and the propodus. Internally it forms a thin, roughly rectangular plate, rather than a joint, which carries a few setæ and a couple of spines. The propodus is large, rather flask-shaped, with its inner margin expanded as a thin plate; this expansion has a thumb-like process at the inner extremity, and is armed near its anterior border with a row of small but highly specialised spines. The joint is attached near its middle to the carpus, the rounded base being adapted to the crescentic enlargement of the preceding joint.

The specialised spines are about a dozen in number and are set in distinct sockets, and a long seta is associated with each. The structure of the spine is difficult to make out, but appears to consist of a stout shaft with a group of stout teeth on one side. In some cases one or two teeth are to be seen on the other side of the shaft, but much nearer its base. I have not deemed it desirable to injure the appendage in order to examine these spines more minutely. The dactylus is long and curved, set at the external angle of the propodus, and it carries on its inner margin a small number of widely separated setæ.

The second appendage (fig. 1f) is similar to the first in general structure, the basis is, however, proportionately longer and more slender, the merus and other joints are also smaller, and the expansion of the propodus which bears the specialised spines is not so great and its margin is much more nearly parallel to the axis of the joint. The spines themselves are rather longer, the lower portion cylindrical and the upper two-thirds tapering to a blunt point. On the posterior side of the shaft about its middle there is a series of small teeth, graduating in size from below upwards, *i.e.*, from large to small. On the opposite side of the shaft, where the tapering begins, there are one or two minute teeth.

The third appendage closely resembles the previous one, the basis and ischium are subequal in length, the latter being more expanded, the remainder of the limb is similar but on a smaller scale, and the specialised spines are more uniformly digitiform with fewer accessory teeth. In the last appendage (fig. 1g) the ischium is very little shorter than the basis and is dilated dorsally, the merus is about half its length and attains its greatest diameter distally. The propodus is approximately cylindrical, and the few spines that it carries only show the minimum of specialisation.

The metasome in its entirety is a little shorter than the two posterior segments of the mesosome.

The telson is distinctly separated from the rest of the metasome, and is a long thin structure tapering near the extremity to a blunt point, which is provided with long setæ.

The uropoda are large, though the basal joint is small.

The exopodite consists of a roughly cordate plate attached by its apex and almost completely conceals the proximal joint of the endopodite. The distal margin of this joint is indented.

The endopodite is two-jointed; a substantial proximal joint supports an ovoid distal joint, not quite so long, and the outer margin of this joint is supplied with long setæ, and these are longer and form a tuft at the extremity.

The pleopoda are all much alike, the first pair are, however, stronger and very little larger than the others.

Only two specimens of this species were taken in Winter Quarters inside the 25-fathom line, one of them in a damaged condition.

Gnathia antarctica.

(Plate I., fig. 2.)

Anceus antarcticus Studer (**18**), p. 4.
Gnathia polaris Hodgson (**8**), pp. 241–3.
Gnathia antarctica Richardson (**12**), pp. 3–4.

Specific characters :—

Male.

Cephalosome quadrangular, with a strongly developed spine in front of each eye. Usually with two spines near the anterior margin and the middle line.

Cephalosome and the anterior segments of the mesosome more or less spinous and fringed with long setæ.

This species was first described by Dr. Studer from an immature specimen taken off Patagonia. Miss H. Richardson identifies my *G. polaris* with *Anceus antarcticus* of Dr. Studer, which, when dealing with the Southern Cross collection, had escaped my attention. I have no reason to disagree with the identification.

The male.—The cephalosome is broad, roughly quadrangular, with the postero-lateral margins rounded; the anterior border forms three crescentic lobes, of which the median is most prominent, but only visible when the mandibles are divaricated; outside the more lateral lobes is a stout spur which is just external to the antennæ and in front of the eye, it has a broad base and its anterior border is irregular if not toothed. The lateral portion of the cephalon is rather swollen but depressed in the centre. It is covered more or less completely with minute spines.

The eyes are prominent and darkly pigmented. Immediately behind the cephalosome is a narrow crescentic segment, the first segment of the mesosome and one which does not reach the lateral margin of the body. The two following segments of the mesosome are short and broad, the next is attached by a distinct "waist" and

generally has a very obvious depression in the centre. The next, or fifth segment, is the longest, and there is a progressive increase in length from the first to the fifth, this one bears more or less distinct traces of a median longitudinal division. The sixth segment is a little shorter than the preceding, and posteriorly it terminates in three lobes, the median is short and the width of the abdomen, the lateral ones are large and project along the sides of that structure. The last segment of the mesosome is much reduced in size and almost fills the interval between these lobes. Laterally the second and third segments of the mesosome are covered with small spines or tubercles, a feature which is not brought out in the figure in the 'Southern Cross' Report. The cephalon and every segment of the thorax bears laterally a number of long slender setæ. A feature which is not alluded to in the original description is the crustaceous character of the exoskeleton, this is usually very prominent down to and including the fifth thoracic segment, although it is to a certain extent covered by a mass of diatomaceous matter. The posterior segments of the thorax and the abdomen are almost invariably thickly covered with a similar growth, often so much as to completely conceal all structural details.

The metasome consists of six joints of subequal size, the telson, a pointed triangular structure with a few long setæ distally being fused with the last one. The epimera are broad blades, curved to a slight extent backwards. The last abdominal segment has no epimera. The uropoda are well developed, the basal joint is short and stout, the two rami are subequal in length, but the endopodite is considerably broader than the exopodite, both are fringed distally with long setæ and have three shorter ones on their external borders.

The first antenna consists of a three-jointed peduncle and a short, four-jointed flagellum. The first two joints of the peduncle are short and subequal, the third is longer than the other two together, all bear a few setæ distally.

The second antenna comprises a peduncle of four joints and a flagellum of six or thereabouts. The first two joints of the peduncle are short, the third is about as long as the two preceding ones together, and the fourth is still longer; this one carries along the side of it a series of setæ of increasing length.

The mandible is scythe-like in general appearance, the amount of curvature of the free end being variable, the outer margin carries a sharp spur near its middle, and the inner cutting edge is slightly sinuous.

The maxilliped is a small structure, the basal plate is rather large, comparatively roughly triangular and attached by its truncated apex. The masticatory process is a small clavate process bearing two stout knobbed processes on the inner side. The palp consists of four small rounded joints which taper slightly from the first, and each carries a few long setæ on the outer margin.

The gnathopod is a large pyriform spoon-like structure forming an operculum over the residuum of the mouth organs. It is attached on one side near the base and its rounded free margin is fringed with delicately plumose setæ. Its surface is

marked with the three characteristic plates. The terminal joint is quite small, ovoid, with very fine setæ on its margin and stouter ones on its surface.

The pereiopods are as usual five pairs and differ but little from each other. The first two pairs are smooth generally, although the carpus of the first has three stout tubercles ventrally, and the propodus bears a row of small spines along its ventral border, one large pectinated spine about two-thirds of its length, and a similar but larger one distally. In all other cases only the two larger spines are present, and these are not so distinctly pectinated. The three posterior pairs have the bases tuberculated dorsally, and the other joints are also tuberculated but to a less extent ventrally. In all cases the ischium is dilated distally and the merus has a well-developed lobe projecting forwards. The limb is fairly well supplied with setæ of varying length and strength. The dactylus is powerful.

Female.—The adult female has an enormously swollen body, and the cephalosome is much smaller than that of the male and certainly not half the length. Its anterior margin has a rounded lobe in the middle line, below which some of the mouth organs project as a wide but truncated rostrum. The preocular spines are smaller than in the male. Two anterior segments of the thorax are distinct, the following three are completely fused though sometimes the lines of segmentation can be observed. The last thoracic segment, which is considerably reduced in the male, is in the same condition in the female. The younger individuals are much more slender, but the fusion of three segments of the mesosome is equally complete; the two anterior ones are more distinct. The cephalosome is smaller still and its anterior margin is angular with a truncated projection in front, and below this the mouth organs project as a conical rostrum; the precise condition of this depends on age. The pereiopoda are similar to those of the male, but more slender and without the tubercular processes.

The drawings illustrating *Gnathia polaris* in the 'Southern Cross' Report were made with great care, but one feature of importance has not been brought into the prominence it deserves, and that is the crustaceous character of the exoskeleton of the cephalon and some two or three segments of the mesosome. This, however, is a very variable feature, and during an examination of the large number of specimens brought back by that Expedition it also appears that the cephalic and thoracic outlines of the animal are not always as depicted in the illustration. The type figured requires no modification, but in other specimens where the jaws are closed the median projection is not visible; a rounded swelling appears at the base of each mandible, but I have been unable to detect the two stout spines which are so characteristic of the 'Discovery' specimens.

The preocular spines almost invariably bear a few more or less distinct subsidiary spinules on the front margin. The crustaceous character of the cephalosome and the first three segments of the mesosome is constant, though often much concealed by a diatomaceous deposit which sometimes covers the entire animal. The cephalosome, too, is more or less completely covered with very small spines; these also occur laterally

on the first three segments of the mesosome, and in some cases also extend as a band right across each segment. The last two segments of the mesosome in the 'Southern Cross' specimens are as a rule evenly rounded laterally, but in the more anterior one of the two there is sometimes a small incision which cuts off the hinder third. We must therefore expect to find a considerable amount of individual variation in this species. Another figure of the male is here given, and this has been drawn from a 'Discovery' specimen.

A number of specimens were taken by the 'Discovery' in Winter Quarters, all of them being extracted from sponge débris. In the roots of these organisms they made their homes. These specimens show a considerable range of variation; a typical example shows the following characteristic features. The cephalosome has a sinuous anterior margin with a very small spine in the middle line; on either side is a swelling which bears a distinct spine at its inner border not far from the middle line. Near the antero-lateral angle and just in front of the eye is a stout toothed spine; the cephalosome is depressed in the centre, but otherwise almost completely covered with small spines.

The first segment of the mesosome is a small crescentic structure squeezed in between the cephalosome and the next; the four following segments progressively increase in length, the fifth and sixth being subequal. The fourth is attached to the third by a conspicuous "waist." The first is only indistinctly spinous, the second and third, and, to a much less extent, the fourth, are strongly spinous, especially laterally, and along the posterior border in two segments at least.

The lateral margin of the fifth segment is invaginated posteriorly, the depression being occupied by a button-like process. The sixth segment is divided into two halves by a shallow transverse depression, and the posterior border, which is much arched, bears a stout tubercle laterally.

A small crescentic segment overlapping the first abdominal represents the seventh. The metasome exhibits five subequal segments with scythe-like epimera. The sixth segment is united to an acutely triangular telson, which bears a few setæ.

The uropoda are large, but not extending beyond the telson. The protopodite is stout, and its inner border is produced into a spinous projection. The endopodite is much broader than the exopodite, and both are fringed all round with long setæ. The entire body is fringed with long setæ, particularly on the cephalosome and anterior segments.

Although many of the 'Discovery' specimens are, to some extent at least, covered with a diatomaceous deposit, it never reaches that extent which it does in the 'Southern Cross' specimens. It is, however, sufficient to hide small details here and there. The variation is great, and in many cases the spinose covering is almost entirely absent, but may exist to a very variable extent. In many cases I have been unable to detect the three median spines on the cephalon as exist on the figured specimen, and the spur at the lateral angle of that structure is sometimes quite simple, at times truncated as if broken.

The crustaceous character of the mesosome is an exceedingly variable feature. Usually the first four segments show it very clearly; in the two following it is usually concealed. The fourth segment frequently has a conspicuous and quadrangular space in the mid-dorsal line, but as frequently this is quite absent. The succeeding segment also bears evidence of a median division, but often it is only partly crustaceous. The sixth segment is rarely crustaceous, but when it is the deposit is not evenly deposited. This segment only rarely exhibits the rounded postero-lateral margins so characteristic of the 'Southern Cross' species; but here, on turning the animal on to the dorsal surface, traces of the button-like process may be detected.

Numerous specimens, male and female and all ages, were taken from the roots of sponges inside the 25-fathom line. A few were taken at a time during the whole of our stay in Winter Quarters.

EUNEOGNATHIA.

This genus was separated from the more widely-known genus *Gnathia* by the Rev. T. R. R. Stebbing, on the ground that the first gnathopod of the male is six-jointed, and that the pleopods have both branches fringed with long plumose hairs.

Euneognathia gigas.

Anceus gigas Beddard (**1**), pp. 137–9.
Euneognathia gigas Stebbing (**15**), p. 338.

Specific characters :—

Male.

Cephalosome short and broad, with a sinuous anterior margin and a short spur laterally.
Depressed in the centre and tuberculated externally.
Maxilliped with 4-jointed palp, setose externally.
Gnathopods 6-jointed, with long setæ externally, short ones internally.

The single specimen measures some 16 mm. in length, the same size as the *Anceus gigas* described by Mr. Beddard in the Isopoda of the 'Challenger' Reports. The following description will show that it must be identified with that species.

The cephalosome is broad, rounded postero-laterally, and has a prominent spur at the antero-lateral angle external to the antennæ and just in front of the eyes. The anterior margin is sinuous, due to fine, small tubercular enlargements. The middle one is the smallest, and is slightly indented. Its surface is rather depressed anteriorly, but abreast and behind the eyes are two prominent tubercles on each side, of which the posterior is much the larger, and this latter is separated by a smooth narrow portion from the tumid posterior margin of the cephalosome. Mr. Beddard's specimen is not satisfactorily figured. The anterior margin of the cephalosome is similar to that of the 'Discovery' specimen, but the tubercles are more exaggerated. The ovoid lobes connected with the eyes do not exist as figured, but in place of them are two prominent swellings, the surface of which is coarsely tuberculated.

The visible segments of the mesosome are smooth; the first is small, somewhat crescentic in shape and does not reach the margin of the body; the second and third are narrow and their epimera are cleft; the fourth segment is much longer than either of the two preceding. The fifth is very nearly as long as the first three together and shows indications of the median longitudinal division characteristic of many members of this family. The sixth segment is narrower but almost as long as the fourth, the postero-lateral angles project backwards as a large rounded process, the inner border of which forms a small tubercle. It is on this process that the last pair of pereiopoda are articulated. The last segment of the mesosome is very small and wedged in between these processes.

The metasome comprises six distinct segments, of which the first is the shortest; the sixth terminates in a telson which is triangular in shape and acutely pointed, fringed with short setæ and with a stout one distally. The epimera are scythe-like in form and distinct from the segment bearing them.

The uropoda are about the same length as the telson.

The protopodite is short and broad and situated at a considerable angle with the last abdominal segment, and prolonged internally as a stout process with setæ at the extremity.

The exopodite is a little the narrower of the two and actually longer than the endopodite. This latter is a little broader and has its inner margin more rounded. Both are fringed with short setæ and less abundantly with long plumose setæ, especially on the inner margin.

The first antenna comprises a peduncle of three joints, the proportions being 2. 2. 5, the last being very much the most slender; this is followed by a flagellum of some half-dozen joints, of which the first is minute.

The second antenna has a peduncle of four joints, the proportions being 2. 2. 4. 5·5. The flagellum has about eight joints. In both cases the joints of the peduncles bear a few setæ distally and also along the last joint; shorter setæ fringe all the joints of the flagellum.

In Mr. Beddard's description the two pairs of antennæ are described as having an extra joint in the peduncle.

The mandibles are strong and scythe-like. Each is slightly curved, pointed distally, and has a prominent spine on the outer margin. The inner border bears two small rounded flanges to fit similar ones from the opposite side.

The maxilliped (fig. 3a) comprises a very thick basal joint, straight on its inner margin, with a series of fine setæ distally, stronger ones proximally, rounded externally and fringed with longer and finer setæ. From its inner angle of this joint there projects a thin, rather triangular joint and externally a four-jointed palp. The joints of the palp are broad and flat; the terminal one, however, is more slender; their proportions are 1. 4. 3. 2. The external margin of all these joints is fringed with plumose setæ, and there are three distally on the terminal joint.

The gnathopod (fig. 3b) is a large, tapering six-jointed structure, articulated to the body laterally and curved forwards over the mid-ventral line; it is shielded externally by a curved and projecting flange of the exoskeleton. The first joint is short and stout, only indicated in the figure; all the other joints except the terminal one are large, flat, and broad; the first of these—the second in point of size—has a fringe of small setæ externally and six rather short plumose setæ distally on the inner margin. The next joint is the largest, and its inner margin is fringed with large plumose setæ; externally there are a few small setæ distally. The three following joints are scarcely as long as the second, the terminal one being minute. Collectively they taper to a blunt point; the third has plumose setæ all along the inner margin, and small fine setæ externally, the other two have these fine setæ all around, but the penultimate one bears a group of long, simple setæ near its distal extremity.

The proportions of these joints are 4. 6. 3. 2. 0·5.

The pereiopoda are all very much alike. In the first pair the second and third joints together are scarcely as long as the first, the carpus is about as long as the preceding, the propodus is longer, the dactylus is about half its size. The proportions are not quite the same on all the limbs, but in all cases the ischium and merus are expanded on their outer margin; in the merus this expansion becomes a forwardly directed lobe. Small groups of setæ occur on these swellings, and a few smaller ones are scattered elsewhere. One or two small spines may occur on the propodus.

A single specimen was taken off Coulman Island in 100 fathoms, 13th January, 1902.

ÆGA.

This well-known genus, established by Leach in 1815, now contains some twenty-five species from all parts of the world. The following species was first taken on the French Antarctic Expedition.

ÆGA ANTARCTICA.

(Plate II.*)

Æga australis Richardson (**12**), pp. 4–6, *not* Whitelegge, Mem. Austral. Mus. iv. (1901), p. 229.

Specific characters :—

No process on the propodus of the first three pair of pereiopoda.
The enlarged endopodite of the uropoda.

This species, of which several specimens were taken, attains a length of 28 mm. and a width of 13 mm.

The cephalosome is small, its anterior margin is slightly rounded, and a stout but short rostrum projects between the antennæ; its posterior margin is rounded, but not quite evenly, the eyes are very distinct, rather small, lateral in position, and irregular in shape.

* The legend should be as above, and not as it was printed off.

The first segment of the mesosome is a little longer than the next two, and about as long as the last; it partially encloses the cephalosome up to the level of the eyes, but owing to foreshortening this is not noticeable in the figure. Its epimera are not distinctly separated off from it, and they are pointed posteriorly. The fifth and sixth segments are longest and widest. The epimera of all but the first are distinct, their external margins are curved, and they are pointed posteriorly. The entire mesosome is covered irregularly with minute punctures, not readily seen while the body is wet. The metasome is a little narrower, and only five distinct segments are visible from the dorsum, the sixth being fused with the telson, which is rather short and broad, its margins slightly curved to a blunt point, the structure being strengthened by a poorly-developed median keel. The margin is finely serrated, and each "tooth" of the serration is accompanied by a spine; the whole border is fringed with small plumose setæ.

The uropoda are large, and project but little beyond the telson. The protopodite is short and stout, having its inner border prolonged in a scythe-like manner as far as the inner angle of the endopodite. The exopodite is narrow, lanceolate, both sides of the distal half bear stout spines at regular intervals, and there is one at the extremity; almost the entire margin is fringed with short plumose setæ.

The endopodite is broader, more leaf-like in shape; it projects to the same distance. The internal margin is serrated, each serration being accompanied by a small but stout spine. These latter are also to be found on the inner margin. All the outer and most of the inner part is fringed with long plumose setæ.

The first antenna has a peduncle of three joints, none of which are dilated; the first is stout and lies at a right angle to the axis of the body, the second joint is shorter, and the third, which is comparatively slender, is three-quarters of the length of the preceding two together. The flagellum is multi-articulate and not very long.

The second antenna has a peduncle of five joints; the first is very short and stout, the second is shorter, the other three progressively increase in length, the last being scarcely as long as the two preceding ones. The flagellum is multi-articulate and half as long again as the peduncle.

The mandible is stout. The mandibular palp is three-jointed; the middle joint is the longest, and the terminal one the shortest. The inner border of the second joint bears a group of setæ near its distal extremity. These setæ are very finely toothed along the distal halves or thereabouts. The distal joint has the external margin rounded; it is fringed with stiff setæ on its straight inner border. These gradually increase in length towards the extremity of the joint, and under a high power they are seen to be flattened and slightly expanded at their extremities. At the extremity of the joint are three or four very much longer setæ armed with delicate teeth, as on the preceding joint.

The second maxilla (fig. 2) is a single elongated joint, rather expanded at the base; its inner margin is straight, and at about two-thirds of its length there is a

notch, as indicating the presence of another joint. This distal portion is rounded, and bears at its inner extremity three prominent teeth. At the notch above alluded to there is a very small finger-like joint armed with two teeth.

The maxilliped (fig. 3) is a very stout appendage. Its basal joint occupies rather more than half the length of the entire structure, the distal joint is triangular and slopes away from the inner margin of the appendage. In the palp five joints may be distinguished; the first is short and broad, the second is roughly triangular, the base being internal, the third is the largest and irregular in shape, being expanded internally. The two terminals are small, and bear three or four strong teeth and a few spinous setæ. The epignath is about three-quarters the length of the basal joint, forming a slightly rounded cone with a few setæ distally.

The first pereiopod (fig. 4) is short and stout; the first joint or basis is very much the largest joint, the ischium is short, expanded distally, and forms the bend of the limb in its natural position; the merus is short and broad, bearing on its inner margin four stout stumpy spines; the carpus is equally broad, but not half the length, and bears two stout spines on its inner margin; the propodus is a little longer than the two preceding, with two strong spines and a few setæ in connection with the distal one. The dactylus is longer than the propodus, and forms a very strong curved claw; the inner margin of this for more than half its length bears a thin membranous addition to its edge.

In the two succeeding periopoda the merus projects over the base of the succeeding joint both dorsally and ventrally, but especially the latter; the carpus also projects ventrally, in both cases forming a curved spinous structure.

The remaining four pairs (fig. 5) are also much alike, but more distinctly destined for locomotion than for prehension. Their proportions are not exactly the same. The basis is the largest and strongest joint. The ischium and merus together are scarcely as long; the former is prolonged dorsally over the latter, and the latter also, but to a much less extent. All the joints except the first have distal fringes of very strong setæ, and the ventral margin bears setæ arranged more or less distinctly as short transverse bands than in a single row. They are, however, arranged as a row on the propodus. The terminal claw is of quite moderate size but powerful.

The pleopoda are of a tolerably uniform character. In the first the protopodite is stout and very broad. The exopodite and endopodite are situated at subequal intervals from the margins and each other.

The exopodite is egg-shaped, the round end being free and thickly fringed with long plumose setæ; the endopodite has a straight and thickened inner edge and is more triangular in shape, the apex being rounded and fringed with plumose setæ.

Specimens of this species were taken occasionally throughout our stay in Winter Quarters, at depths down to 125 fathoms. The smallest example is scarcely 12 mm. long. Several more or less digested specimens were taken from the stomach of a Weddell's seal.

CIROLANA.

Another of Leach's genera, established in 1818 and now containing about thirty species from all oceans. The following species has not been previously recorded.

Cirolana meridionalis.

(Plate III.)

Specific characters :—

Fifth segment of the metasome narrower than the preceding one, but the lateral margins are not covered by the fourth segment.

No eyes.

The total length of the animal is 35 mm., its width 15 mm. The cephalosome is very strongly marked off from the body and no trace of eyes can be discerned. Its anterior margin is rounded but slightly, excavated for the origin of the first antenna, between which there is a small rostrum, it is unevenly rounded laterally and the posterior border is incurved to a slight extent.

The mesosome is quite smooth, in life rather thickly spotted with light yellowish spots on the brown ground colour. The seven segments are distinct, the first is the longest, but owing to the curvature of the body it is foreshortened in the figure and partially encloses the cephalosome; the second is about half the length; the others, up to the fifth, progressively increase in length; the sixth is very little shorter, and the seventh shorter still. Except on the first the epimera are distinct from their respective segments, increasing in size to the fifth and, again except the first, pointed posteriorly.

The metasome comprises six segments, of which the last is fused with the telson. The first segment is very short, the others progressively decrease in width, the fourth to some extent overlapping the fifth laterally. The epimera of the four anterior segments progressively increase in size from the first and are acutely pointed.

The telson is broad and rounded, but terminating in the middle line in a small projection. Its distal margin is setose.

The uropoda are large; the short and stout protopodite has its inner angle produced as a spur and bears a narrow leaf-like exopodite setose all round; the endopodite is really about the same length but broader and similarly setose; it projects just beyond the end of the telson.

The first antenna has a three-jointed peduncle, the first is very short and stout, the second less stout and shorter, the third is as long as the other two together. The flagellum is twice the length of the last joint of the peduncle and consists of a number of stout but very short ill-defined joints. Its anterior margin bears a number of stout setæ; at first sight these look to be more like spines, but they are certainly of a sensory character.

The second antenna also has a peduncle of three joints which progressively decrease in stoutness but increase in length. The multi-articulate flagellum is of some length.

The mandible is very strong and provided with a four-jointed palp. That of the left side of the animal has a straight cutting edge, bevelled anteriorly and posteriorly prolonged into a stout spur of some length. The cutting edge is hollowed out internally to receive the mandible of the opposite side, here there is no spur, and the cutting edge is cleft to form two very stout teeth. This is as examined *in situ*. The palp is four-jointed, but the first is extremely short, the proportions of the others being 5. 7·5. 3·5. The second joint has the distal half of its external border provided with somewhat specialised setæ, the longest are at the beginning of the series, and speaking broadly there are only two sizes. The terminal joint is curved, fringed throughout its inner border with stout setæ; these gradually increase in length distally and the joint terminates with three long ones.

The first maxilla (fig. 2) has a small but irregularly shaped masticatory lobe; its outer border projects forward as a broad lobe, its inner and lower border, which is rounded and considerably larger, bears three very large spinous processes; of these the most posterior is longest and most slender; each has a thick tuft of fine setæ about the middle of its length where the spine is distinct as such from its basal process. The outer lobe is large, arched towards the middle line, its margin there being almost straight. This is armed with eleven very strong spines though their length and strength is variable. At the lower inner angle there are two small spinous tubercles, one bearing five small spines arranged like the prongs of a fork, the other has only two spines.

The second maxilla (fig. 3) has a short and broad masticatory lobe; this has a slightly rounded internal margin armed with numerous long and strong setæ. Three setæ near the posterior angle are very much longer than any of the others, and become plumose by the presence of hair-like structures. The remainder of the setæ do not vary greatly in size, and all except those near the anterior angle are, to some extent at least, plumose. Two lobes arise from the outer part of the masticatory lobe, the inner one is the broader and of an elongated ovoid form; the inner border and distal extremity is provided with long and stout simple setæ of two distinct sizes, and form two rows along the inner margin. The outer lobe is narrow and terminates with four long simple setæ and two smaller ones.

The maxilliped (fig. 4) is remarkable for the disproportion between the masticatory portion and the palp. The former comprises a short but stout joint, the inner margin of which is rounded proximally, and this is followed by another short joint which has a straight inner margin, and from its distal inner angle it slopes rapidly to a much shorter slightly rounded external margin; the inner distal margin carries four stiff plumose setæ, and near these is a single prominent tooth. It is behind this that the first joint of the five-jointed palp lies. The joints of this

appendage are all very short and broad and thickly bordered on both sides with long simple setæ, some of which on the inner margins of the last two joints are distinctly spinous. The third and fourth joints are much expanded internally, and the fifth is a very broad stumpy joint. The second joint has short stout setæ on its distal margin. The epignath is a very small rounded plate external to the basal joint.

The pleopoda are approximately uniform in structure. The first has been removed for examination. The protopodite is short and broad; its external margin projects as a short, stout backwardly directed process, the inner margin is rounded and bears a dense fringe of short plumose setæ, among which are a number of spines. The exopodite is a pointed egg-shaped structure, attached near the point; its external and distal margins are densely fringed with rather long plumose setæ. The endopodite is directed inwards from its attachment and then bent at a right angle, the anterior and inner edges being thickened and straight; they are fringed with fine setæ, which ultimately become long and plumose around the distal third of the joint. The inner edge is rounded.

The pereiopoda are all very much alike. In the first (fig. 5) appendage the basis is the largest joint and rather scantily fringed with long setæ along its dorsal margin. This fringe is double, that is to say, dorso-lateral. A strongly developed distal fringe occurs ventrally, the ischium is a short joint and its dorsal margin projects as a shield over the next joint for some distance; this shield is fringed with long setæ; a row of setæ occurs along the side of the joint near its end; a group occurs about the mid-ventral region and a row occupies the more distal portion; the merus is very short if measured along its ventral margin, but dorsally it projects quite to the middle of the propodus; this projection bears numerous long setæ; the ventral margin bears some four or five strongly developed spines and several weaker ones of irregular size. The carpus is quite a small joint, roughly triangular in shape, the distal half of its ventral margin is fringed with spines, which increase in strength and size distally, the dorsal margin is reduced to a minimum; the propodus is stout, slightly curved, with four spines ventrally. The dactylus is strongly developed, more than half the length of the propodus.

The other appendages are built on exactly the same plan, differing only in the strength and abundance of the spinous or setose armature. The four anterior pairs conform most distinctly to this type; in the remaining three the propodus is longer and more slender and the dactylus shorter.

The dorso-lateral fringes of setæ on the bases of the more posterior appendages become very strongly developed. The sixth appendage is typical of the other extreme of variation (fig. 6). The basis has two dense dorso-lateral fringes of plumose setæ, a few arise ventrally just beyond the middle of its length, while distally they form a dense tuft. The ischium is articulated at the dorsal angle of the basis; it is rather more than half its length, and the so-called dorsal shield projects but very little—it is scarcely prominent—the merus is two-thirds the length of the ischium, and the

dorsal shield is small and inconspicuous. The carpus is scarcely as long and much more slender, the propodus is longer and still more slender, the dactylus is rather short. There are but few spines properly so called on this appendage, the merus, carpus and dactylus bear several as distal fringes or on the ventral surface of the joint, which are of a distinctly spinous character. The setæ on the ischium, except those dorsally situated, are indistinctly plumose, elsewhere they are simple.

A single specimen of this species, a female, was taken in the traps in Winter Quarters, 29. 8. 03. in 25 fms. Another, mutilated, example was found in a seal's stomach, 31st January, 1903.

SEROLIS.

This genus was established by Leach in 1818 and now contains twenty-four species, nearly all of which are from the southern hemisphere.

Serolis trilobitoides.

(Plate IV.)

Serolis trilobitoides Eights (**6**), pp. 53–57.
Brongniartia cornuta Studer (**17**), pp. 21–24 ; Beddard (**18**), pp. 49–53.

Specific characters :—

Body broadly ovate, with large serrated epimera curved backwards, the sixth thoracic segment not extending much beyond the insertion of the uropoda.

Cephalosome with well-developed eyes, two swellings between them having the posterior margin three-lobed as the adult condition is reached.

Urosome pentagonal, margin dentate from the insertion of the uropoda, a median dentate keel terminating in a short caudal spine. On each side an oblique ridge terminating in a tooth near the insertion of the uropoda. Two teeth separated by a small recess in the middle line before the beginning of the median keel.

Special spines on the propodus of the second thoracic appendage consisting of sensory teeth alternating with broad leaf-like sensory structures, of which the blade is unequally developed on the two sides of the shaft.

The body is nearly circular, the largest specimen measures 48 mm. in length and 43 mm. in width. If the basal joints of the antennæ, which are directed forwards, be included the length of the animal is increased to 53 mm. The epimera are large with a finely serrated external margin, all more or less curved backwards ; those of the sixth thoracic segment reaching nearly to the end of the caudal shield. Those of the abdominal segments terminate just in front of this and are subequal. The posterior margin of each of the thoracic epimera bears a tubercular swelling at about one-third of its length. The urosome is pentagonal in outline, its free margin from the insertion of the uropoda is beset with numerous pointed teeth and terminates in the middle line in a stout spine. In the larger specimen this is broken, but, judging from the smaller one, it should be about 3 mm. long. The middle line of the urosome is marked by a prominent ridge bearing seven teeth of variable size ; the first is the largest and the posterior ones are the smallest. In front of this ridge, at the junction of the caudal shield with the third abdominal segment, there is a prominent lip which

bears two teeth separated by a rounded recess. Close to this rises a ridge on each side, which runs outwardly to end in a stout spine above the point of insertion of the uropoda. The cephalosome is about one-fifth the length of the body, it is separated off from the epimera of the first thoracic segment by a very distinct groove, which passes forward in a slightly curved line just outside the eyes. The anterior margin is bevelled to receive the first antenna, and presents three crescentic depressions, of which the median one is the largest, and further subdivided by a small median tubercle between the antennæ. A median plate with rounded angles lies between the eyes anteriorly, and behind it most of the space is raised into two irregular and flattened enlargements with their posterior margins rounded, a median lobe on each side being conspicuous.

Between and behind these enlargements is a narrow plate with a small dark tubercle in the centre. The eyes are prominent, large; except anteriorly they are separated off from the two tuberculated enlargements alluded to above by a deep groove. The cornea is oblong, lunulate, and composed of a large number of small facets. The first thoracic segment is separated from the second by a line of segmentation, distinct enough at its origin, but which dies away before it reaches the margin. The anterior margin of these two thoracic segments, like that of all the epimera, is minutely serrate. The last thoracic segment is invisible from the dorsum, and the first abdominal, which is without epimera, is enclosed by the arching forwards of the seventh thoracic. Only on the third, fourth and fifth thoracic segments are the epimera distinct from the thorax.

Eights' specimens attained a greater size than the largest obtained by the 'Discovery,' and measure 70 mm. × 57 mm., and an adult male is figured both from the dorsal and ventral aspects. Dr. Studer's specimens obtained from Kerguelen Island are not half this size, and those obtained by H.M.S. 'Challenger' from the same locality are intermediate, the largest being a female measuring 41 mm. × 35·5 mm.

For his specimens Eights describes and figures a ridge running obliquely backwards from the inner border of the epimera of the first thoracic segment towards the middle of its posterior border, before reaching which, however, it dies away. This is the only difference I can find between his specimens and those taken by the 'Discovery' when viewed from the dorsum. The dark coloured tubercle Eights regards as a possible ocellus; I am unable to make any statement on this point, this structure being injured in the larger specimen. Dr. Studer ignores it altogether, Mr. Beddard figures but does not refer to it.

Dr. Studer accentuates the fact that, in his specimens, the enlargement between the eyes forms conical tubercles, a single one on the inner side of each eye, instead of a diagonal row. The "diagonal row" is an expression due to a defect in Eights' figure, and Dr. Studer's fig. 2 might be a copy of Eights' as regards this particular feature. The point at issue seems to be whether these enlargements each form a

conical tubercle (Studer, Beddard), a rounded tubercle ('Discovery'), or as Eights words it the entire space is elevated to form "somewhat the figure of a corona in high relief." The description and figure are not too explicit, but it does not appear to be a matter of vital importance. Dr. Studer further points out that the median ridge of the caudal shield bears three teeth only, the first of which is the largest. His figure from its great breadth is probably that of a female.

Mr. Beddard gives much better figures of this species, and increases the number of teeth on the keel of the caudal shield from three to six.

From the sizes of the specimens obtained in these collections it would appear that the greater number are not adult. Eights' specimen, as figured, unquestionably is so; the larger 'Discovery' specimen is approaching that condition. In reply to an enquiry, my friend, Dr. Calman, confirms my suspicion that the 'Challenger' specimens are not adult, the largest female, which has been partially dissected, bears traces of having had oostegites, in the others they are quite rudimentary. None of the males have the third thoracic appendage modified.

The sternum is quite smooth, that of the first thoracic segment which bears the maxillipeds is narrow and enclosed by the succeeding one. It projects forwards in a conical manner between the maxillipeds and bears a median ridge. The second passes completely across the body, the epimera being separated by a groove.

In the middle line the median keel of the preceding segment is continued through half its length, where it widens out and disappears; behind this is a groove which forms the anterior boundary of a lip-like structure rather more than 5 mm. wide. The three following segments are conspicuously divided in the middle line, the remainder less distinctly so. The sixth is only indistinctly separated from the following, while the seventh and eighth are fused.

The posterior border of the first three abdominal segments is, in the middle line, produced backwards into a spine. Small in the first, it is but little larger in the second, but in the third it is very much larger. This feature is alluded to by Mr. Beddard as a sexual character, but one which is not constant in all species. For this particular species it is not alluded to either by him or Dr. Studer, and Eights' figure is not satisfactory in this respect. What I take to be the genital apertures are two small ovoid slits near the posterior border of the last thoracic segment and some little distance from the middle line. Mr. Beddard states that these apertures are invariably circular in the male, but neither he nor Dr. Studer allude to them for this species. Eights is equally silent on this point.

The first antennæ rise in a depression of the anterior margin of the cephalosome, and are directed outwards. Each consists of a tapering four-jointed peduncle, the proportions of these joints being 3. 5. 4. 2·5, and they are followed by a multi-articulate flagellum.

Dr. Studer states that the flagellum has twenty-two joints, Mr. Beddard states twenty-five. In all the 'Discovery' specimens the flagellum, although injured,

contains more joints than quoted by either of these observers. The peduncle and most of the joints of the flagellum show markings as of imbricated scales, and having at short intervals very delicate aborescent chromatophores. The joints of the flagellum each bear a tuft of a few setæ and a sensory seta. This is a rather long thin structure containing granular matter and mounted on a short but stout peduncle. Owing to injury it is difficult to make out the details of its structure, but in a few cases they appear to be identical with Mr. Beddard's figures.

The second antennæ have five-jointed peduncles, in each case the first joint is not visible from the dorsum and is small; this and the second are directed forward, the third being articulated at a right angle; this and the two following are grooved longitudinally, the proportions of the various joints being 1·5. 3·5. 5. 8. 11. The multi-articulate flagellum is not as long as the terminal joint of the peduncle. The margin of the peduncle is fringed with setæ, small and fine ones singly, longer ones in small tufts at intervals. The joints of the flagellum number sixteen, in agreement with Mr. Beddard, and have the appearance of being covered with imbricate scales, irregularly hexagonal in shape; along the centre joints there is a row of teeth, those figured by Mr. Beddard do not give an adequate idea of their structure. They occur on the fourth to the tenth joints inclusive, and consist of a strong tooth directed forwards, its posterior margin being produced into a thin blade like a knife edge.

The flagella of both antennæ are fringed with extremely minute spines.

The upper lip or epistome is triangular with its angles rounded, the broad base being posterior and straight, with the exception of a slight indentation in the middle line.

The anterior borders are enclosed by an independent but narrow ridge. The epistome itself bears two circular depressions, a fact noticed by Eights, but his figure as regards this structure is not good.

The mandible is very strong, and has a stout base directed obliquely inwards; a blunt process on its anterior margin marks the point where it turns to the middle line, tapering to end in a stout cutting edge. This edge is strongly coloured, and the left mandible, viewed externally, exhibits two small tubercular teeth with traces of a third; some little distance from the cutting edge there projects from under the posterior margin a tubercle belonging to the inner series, and behind this a rather long bifurcated spine. Internally there is a second cutting edge which comprises three stout tubercles and two small ones between and a little behind the first and second. Another weaker ridge lies behind this, and from the posterior end of it the bifurcated spine arises.

The palp is long and three-jointed; rising from the outer angle at the base of the mandible two joints lie in front of the epistome, the third being directed straight forwards between the antennæ. The proportions of the joints are as 5. 8. 3·5. The first joint bears a single long seta of simple structure, the second bears several, but at its distal and ventral extremity they become highly specialised. The last joint is a flat blade with a rounded dorsal margin and nearly straight ventrally. The

ventral margin is nearly completely occupied by the same highly specialised setæ. Here they graduate in size to the distal extremity, where they rather quickly become much larger than elsewhere. These setæ (fig. 3) consist of a shaft with very finely granular contents, the shaft tapers and ends in a blunt point, which in certain aspects appears to be an elongated knob. Both margins are fringed with very delicate flat teeth, very close, in fact contiguous to one another. These appear to be set on the shaft at an angle so as to form the limbs of a V, of which the shaft forms a very broad base. The ventral margin of the second joint is very minutely dentate. None of the authors previously cited deal with this appendage in any detail. Eights describes the left mandible as having "two corneous teeth, placed one within the other, that on the right contains but one; they are convex externally and internally concave, with a small foramen at their base." This latter statement I do not understand. As regards the palp, he states the two basal joints are subequal in length and the terminal one about half the size. Dr. Studer states that the cutting edge is divided into two ridges and bears no teeth, but only sharp undulating edges. This figure is not good; he omits almost all the setæ on the terminal joint of the palp, but in the comparative sizes of the joints they more closely resemble the 'Discovery' specimens. The only reference I have seen to the highly specialised setæ is contained in Dr. Pfeffer's description of *S. septemcarinata* (**11**), and he figures them for that species as being plumose to within a short distance of the enlarged end.

The first maxilla (fig. 4) consists of two lobes. The inner one is very small and delicate, the outer one large and strong. The inner one is irregularly ovoid upon a short peduncle, the outer one is stout and slightly curved. Its cutting edge is hollowed out to some extent, and the margin is fringed with stout spines of variable length, but the largest are most anterior. In the specimen examined there are eleven of these. The dorsal margin of this joint is covered with very minute teeth, which are replaced by simple setæ about the middle of its length.

The second maxilla (fig. 5) is more delicate in structure, and comprises a thin but broad inner lobe, rounded distally and there provided with upwards of thirty specialised setæ. About two-thirds the length of this lobe there arise externally two lobes of approximately equal size. It would, perhaps, be correct to say a single bifid lobe. Each of these lobes is armed distally with two stout specialised setæ, similar to, but much stronger than, those of the inner lobe. The setæ are all pedunculate. A central core runs continuously through the peduncle and shaft, and the latter is covered with a number of very minute but stout spines.

The maxilliped (fig. 6) consists of a short but very broad sub-triangular plate, which carries the large masticatory lobe, and an approximately rectangular epignath. The inner margin of the masticatory lobe is straight, rounded towards the base, where there is a group of rather long simple setæ, and a few other small ones are scattered along it. The anterior margin is nearly straight, and bears a stout tooth near each angle. The outer tooth is situated in rather a deep depression. The outer margin

is rounded. The palp is three-jointed. The first is very small, the second large, cordate in shape; the third is a rather short and broad lobe, articulated nearer to the outer portion of the second. The inner margin of the second joint and the extremity of the first are richly clothed with simple setæ. A few other small ones are scattered along the other margins, and also irregularly over the surface of the entire palp, masticatory lobe, and distal portion of the epignath.

Eights' description of this organ is not easy to interpret exactly, but as far as it goes it agrees with the above, except that a single tooth is only mentioned as occurring on the masticatory lobe. As the second may be easily concealed by the palp, this is of small moment.

The descriptions given by Dr. Studer and Mr. Beddard are very concise. The figure given by the former is very crude and incomplete, though fairly correct as far as it goes. Mr. Beddard's figure is very much more correct and detailed. Only one tooth is figured, the position of the second being covered by the palp. The basal plate is, however, figured as being divided. I have not been able to detect the existence of such a division even with a $\frac{1}{8}$ objective; bands of muscle interfere greatly and render its determination difficult.

The first appendage of the mesosome is subchelate and comprises six distinct joints, the first of which is subequal in length to the last but one. The three following are all very short, and two, the more distal ones, have a very irregular shape. These three short joints all bear a tuft of somewhat specialised setæ, which are numerous only on the third of the joints, and this one, with the second, bears a number of very minute teeth on its inner margin, the third having in addition two stout teeth and a third much smaller one. The propodus is large and ovate in shape, its inner margin being flattened to form a blunt knife edge and provided with a series of very highly specialised structures, which have not been described for this species, notwithstanding the fact that they afford valuable specific characters. Eights describes the margin of this joint as ciliate. Dr. Studer remarks that it is provided with lancet-like teeth, and figures five joints of this appendage, but on so small a scale as to be worthless. Mr. Beddard does not refer to this appendage except in very general terms. The specialised structures (figs. 7 and 8) consist of a regular series of stout teeth, and alternating with them are leaf-like blades, both being obviously of a sensory nature. The teeth have a strongly-marked "midrib," which, however, is not quite straight, and terminates in a delicate elongate sensory structure. The blade is very faintly striated, and terminates in an irregular manner, to allow the sense organ to protrude. The "leaf-like" organ also has a distinct "midrib," but the blade is very unequally developed on the two sides, and exhibits a much coarser striation than the tooth. The "midrib" terminates in precisely the same way and in a similar sensory structure.

Of the remaining appendages of the mesosome four progressively increase in size, the second to the fifth; this and the sixth are subequal in size, but the seventh is much smaller, but in the larger of the 'Discovery' specimens the greater part of most of these

appendages are lost ; they are, however, uninjured in the smaller specimen. The first appendage of this series, the second of the mesosome, comprises six joints, the first of which is large and stout, the rest progressively decrease in size, and all are liberally provided with small arborescent chromatophores. The second joint has two serrations on its outer or ventral side, at each of which are a few long setæ, distally, both ventrally and dorsally, but not laterally ; there is also a distal fringe of long setæ ; the following joint has a single serration, the next has three, and the setæ connected therewith are distinctly spinous ; the penultimate one has seven of these so-called serrations, but very small at first, increasing in size distally ; the setæ they bear are very small at first but increase to long ones distally, on the opposite side of the joint the distal fringe is long and spinous. The ventral margin is slightly expanded and flattened as a blade, chiefly proximally. The sixth joint or dactylus is stout and capable of folding on the preceding one in a subchelate manner. This appendage constitutes a secondary sexual character in the adult animal where it becomes modified to form a prehensile organ, and differs considerably from the remainder which are distinctly locomotive in function. As such it is figured and very briefly described by Eights. For this species or *S. cornuta*, neither Dr. Studer nor Mr. Beddard give any description of this appendage as distinct from the others, though both refer to its modification generally among members of the genus. From this and other circumstances as previously indicated it may be assumed that their specimens were immature. The other thoracic appendages are alike in structure, the propodal joint is slender and not in any way expanded, nor does the dactylus appear capable of being reflexed upon it in a subchelate manner. The spinous armature varies with the size of the limb or the joint where it occurs, and the last appendage of the mesosome only differs from the others in size.

Of the abdominal appendages the first three pairs are adapted for swimming. The base of each limb is roughly in the form of a truncated cone directed towards the middle line, and articulated to the sternum near one corner of the narrow base which is curved outwards ; this angle bears three stout setæ on the first and two on the remaining appendages, other fine setæ fringe these joints throughout.

The exopodite is a delicate semicircular structure fringed with fine setæ, and on its curved border with long plumose setæ. The endopodite is smaller and attached to the protopodite at about two-thirds of its length ; this shows more distinctly a ribbed structure, each rib corresponding to a long plumose setæ. The three pair of appendages do not differ materially in shape or structure except that the straight posterior border is prolonged into the "penial filament." This is a slender rod-like body passing towards the middle line, it then bends somewhat abruptly backwards, and is grooved on its inner side. It is about 4·5 mm. long, and appears to be jointed at the bend ; but this is probably due to injury, as there is no trace of such a structure in the smaller specimen where, moreover, this organ is very much smaller. This organ of the larger specimen is very much smaller than that indicated in Eights' figure. In their description of *S. cornuta* neither Dr. Studer nor Mr. Beddard allude to it.

The pleopoda are four paired structures occupying the entire area below the caudal shield. Each pleopod consists of a very broad and short basal joint bearing an exopodite and an endopodite, which lie over one another, the exopodite being the outer or more ventral structure. The exopodite of the first gill is the largest and coarsest in structure, forming an operculum over the rest. The plate is obliquely divided into two by a suture, and its stout straight inner margin is thickly fringed with fine setæ; the outer margin, which is rounded anteriorly and wide, tapers slowly to a blunt point and is fringed with rather long plumose setæ. The endopodite is much more delicate, rather smaller, having no setæ whatever, and it is not divided, though its outer margin bears a conspicuous notch where the division should be. The posterior gill is shorter and broader than the preceding one; the exopodite is obliquely divided, but the only setæ it bears are a few of both kinds at the distal extremity; the endopodite resembles that of the first gill.

The uropoda are attached to the caudal shield where the edge becomes dentate; the basal joint is short, expanded distally, and prolonged on the inner side into a spinous process. The exopodite is two-jointed, the terminal one being scarcely half as long as the other, pointed, and having two serrations on the outer side and two spines on the other. The endopodite is a little longer than the first joint of the exopodite, and its external margin is serrate and has a few setæ in addition; the internal margin is also serrate but only distally.

Two males and fragments of two others, sex uncertain, were taken by the 'Discovery' in lat. 67° 21′ 46″ S., long. 155° 21′ 10″ E., 254 fathoms, bottom mud. The trawl passed over a patch of stones probably dropped by some wandering iceberg, and brought up so large a quantity of these that the specimens were very severely damaged, and the trawl had to be slit up completely to save anything.

Both Dr. Studer's and Mr. Beddard's descriptions of *Serolis cornuta* are defective in many points. The niceties of specific discrimination as now understood were altogether unknown in Eights' day. Almost invariably the defects of previously published descriptions are those of omission rather than commission, and going through them exhaustively with the 'Discovery' specimens before me, I have no hesitation whatever in definitely stating that the 'Gazelle' and 'Challenger' specimens are immature specimens of *Serolis trilobitoides* Eights, and that the 'Discovery' specimen is only just arriving at the adult stage.

CYMODOCELLA.

Pfeffer (**11**), pp. 109–110; Hansen (**7**), p. 107.

The following definition of this genus is by Dr. Hansen—

> Both sexes similar without processes.
>
> Distal part of the abdomen somewhat produced, with the lateral walls bent strongly downwards and inwards, constituting rather a long tube open at both ends and with a slit on the lower surface.

Uropoda similar in both sexes, rami lamellar, exopodite considerably shorter than endopodite.
Mouth parts similar in both sexes.
Male with appendix masculina on the endopodite of the second pleopod.
Marsupial lamellæ overlap each other somewhat, the brood in an exceedingly large external pouch and in the marsupium.

Cymodocella tubicauda.

Cymodocella tubicauda Pfeffer (**11**), pp. 110–115.
Sphæroma egregium Chilton (**2**), p. 209.
Cymodocea antarctica Hodgson (**8**), pp. 243–245.
Cymodocella egregia Hansen (**7**), p. 126; Richardson (**12**), p. 7.

This species was first described by Dr. Pfeffer from specimens taken in South Georgia. It was then found by Dr. Chilton in New Zealand—the South Island; more recently it was taken by the 'Southern Cross' Expedition in the Auckland Islands.

On all these occasions it has been more or less perfectly described as a new species. It now turns up off the Antarctic continent at Cape Adare, and it is hoped that its identity is now fully and permanently established. As my description of the animal was so unsatisfactory it is here re-described. It is a little unfortunate that both Dr. Hansen and Miss Richardson have made use of Dr. Chilton's name for the species. That of Dr. Pfeffer has a priority of five years.

Specific characters :—

Body vaulted, cephalosome short, with small dorso-lateral eyes.
Antenna invisible from above.
Pereiopoda ambulatory, first the shortest, the remainder very slightly increasing in size, armed with a stout curved claw on the dactylus and one, occasionally two, stumpy accessory ones.
Metasome, always with one distinct segment, and two others imperfectly separated dorsally; a pointed tubular urosome.

The cephalosome is small, rather broad but short, the anterior margin, seen from above, is rounded, it bends downwards and terminates with a small rounded rostrum between the antennæ; the lateral margins bulge for the reception of the small eyes which are postero-laterally situated; the posterior margin is incurved. It is about two-thirds the diameter of the first segment of the mesosome.

The mesosome comprises the normal seven segments of which the first is the longest and largely envelops the cephalosome, the epimera are large, ending posteriorly in a blunt point. The succeeding three segments are subequal in length, with rather small irregularly rounded epimera. Of the three posterior ones the first is a little shorter than the others. The epimera are larger and project backwards, the last of the three segments is narrower than the rest, and the posterior border of the epimera rises abruptly from its segment. In no case are the epimera separable from their respective segments.

The metasome comprises three or four segments and a urosome, a circumstance which does not seem to depend upon age. In many individuals of varied size, and therefore presumably of varied age, a short segment is to be seen between the backwardly projecting lobe of the epimera of the last segment of the mesosome. This segment is very often undeveloped or concealed. Another segment has a peculiar posterior border; it passes across the mid-dorsal line and at some little distance from it it forms an angular projection backwards, and then on in a slightly sinuous line to the epimeron. Just outside the angular projection two lines pass forward in a crescentic manner to lose themselves after a short course. This proves the segment to be incompletely divided into three.

The urosome is as long as the five posterior segments of the mesosome; it tapers posteriorly, and the lateral margin is inflected so that it terminates as a spout with an oblique orifice, and the pleopoda lie in a sort of pocket. The inflected margins are not fused distally, a narrow groove separates them.

The uropoda are conspicuous but not very large, not reaching the extremity of the urosome. They arise from a notch near its anterior border and possess a stout protopodite; the exopodite is much smaller than the endopodite, of which the inner half is much thickened; both are lanceolate in form. The endopodite is larger in proportion and somewhat more angular in some of the smaller specimens.

The antennæ are completely ventral in position, the first lies naturally in a groove between the cephalosome and the epistome.

The first antenna has a very stout peduncle of three joints. The first is as long as the other two together, very stout and bent at the base; the second is equally stout but short; and the third is much more slender and a little longer; the flagellum consists of six joints.

The second antenna is larger than the first and rises quite close to and underneath it; the peduncle is three-jointed, the three progressively increasing in length; the flagellum comprises eleven joints, each of which, except the first, has a couple of tufts of specialised setæ on the ventral surface.

The buccal mass is rather prominent, and the epistome is triangular in shape with a wide and shallow piece taken out of the base.

The mandible is strong, curved and tapering, but with a sinuous margin; the cutting edge is reduced to a blunt point, bifid, to form two strong but short teeth; on the inner side and a short distance from this is a group of stout spines. The molar process is stout, rather long, and forms a broad cutting edge.

There is a three-jointed palp, the first two joints of which are subequal, the third is shorter. The second has half-a-dozen strong spinous setæ distally on its inner margin, and the third has a series beginning about one-third of its length, at first small, but the distal ones are very long.

The first pair of maxillæ consists of two long slender lobes united at the base by a connecting piece; fully one-half of the inner lobe is imbedded in muscle; the

exposed part is a narrow, rather tapering band, terminating in four stiff plumose bristles; the outer lobe is much broader and terminates in four strong teeth and some half-dozen smaller pectinate ones.

The second pair of maxillæ is elongate, the inner lobe is broad, very slightly tapering and curved backwards; the inner border is fringed with fine setæ and distally with plumose bristles. Of the two outer lobes, the inner one is a little the broadest; both terminate in long plumose bristles.

The maxilliped is long, divided into two equal halves as regards length. The inner margin is straight throughout; the basal half tapers in a sinuous line to about half its diameter; the distal half is narrow, rounded externally, distally armed with numerous and thickened plumose bristles, one papilliform tooth, and at least two of these bristles occur on the inner margin. The palp is five-jointed; the first joint is small; the second is the longest and has distally a long stout digitiform process armed with setæ; the third joint is short, its process a little larger than the preceding and occupies the whole joint. The fourth is twice as long and a smaller process is directed forwards; the terminal joint is slender and setose. The epignath is of moderate size, about half the length of the basal joint and ovoid in shape.

The pereiopoda are all very much alike and of quite simple structure; the first is the shortest and stoutest, the second is a little longer, and from this onwards they progressively increase in size to the last; the increase is, however, very small and chiefly concerns the first two joints. Of the first pereiopod the basis is stout, constricted immediately beyond its articulation with the body; the ischium is more than half the length; the merus is short and considerably expanded dorsally to form a sort of shallow cup for the carpus; this joint is very small, triangular in fact, its dorsal margin being reduced to a minimum; the propodus is a stout joint, third in point of size, and its proximal end is in contact with the merus dorsally. The dactylus is half the length, stout, and carries a curved nail distinctively marked off from the joint, and immediately underneath is a small but very stout accessory claw. A few setæ occur distally on all the joints except the first two; on the carpus and propodus there is distally and ventrally a single stout denticulate spine, closely resembling those on the ovigers of many Pycnogonids.

In the remaining appendages the basis increases a little in length, the ischium increases more, so that on the last appendage it is nearly as long as the basis. The merus is larger than on the first limb, but very little larger than the carpus; both these joints are dilated distally, the former retaining its forwardly directed dorsal lobe; the propodus remains a simple cylindrical joint, and the dactylus stout and curved, discoloured, and provided with a small but very stout accessory; sometimes there is a second. Setæ occur distally on all the joints and occasionally elsewhere. There are no denticulate spines.

The pleopoda. The first pair comprises a very short and broad protopodite. The

endopodite has a broad base, a straight inner margin, the greater part of which is covered with fine setæ. The inner margin tapers to a rounded apex, which is provided with long plumose setæ. The exopodite is a little longer, much more delicate, ovoid in shape, fringed distally with long plumose setæ. Where the exo- and endopodites do not overlap the endopodite is very stoutly built.

The second pair, the endopodite, is similar to that of the first, but quite without any thickening; the exopodite is very much smaller, ovoid, and the plumose setæ occur throughout the outer margin as well as distally. The appendix masculina is a narrow structure of almost uniform diameter; it is slightly curved and enlarged near the distal end. On the inner side of this enlargement and on the outer side of the rounded extremity are series of very minute, backwardly-directed spines; it is longer than the endopodite. The third pleopod is like the second, but the inner margin of the endopodite is slightly strengthened.

The fourth pair has the exo- and endopodites subequal in size, heart-shaped, with a shallow notch near the apex; they are thicker and more fleshy than the preceding; they carry no setæ. Both endo- and exopodites have an oblique fold in passing from the antero-exterior margin towards the postero-lateral margin. The fifth pleopod is rather larger than the preceding. The endopodite is more irregularly cordate and has an oblique fold. The exopodite is larger and two-jointed, the second joint being about one-fifth the length of the whole and terminates in a blunt but thickened point. Another similar thickening occurs about the middle of its inner border and close to it, and on the main joint is a further thickened knob. A ridge runs from this along the inner border of the first joint for some distance and passes straight on inside a lobe of the exopodite.

A rather large number of specimens were taken at Cape Adare on February 24, 1904, from the root of a large laminarian *Lessonia grandifolia*, taken in 17 fms.

ANTARCTURUS.

The genus *Arcturus* was established by Latreille in 1804, and since that time it has received a very large number of species, chiefly from the Southern Seas. Now, however, the genus is to be broken up. Dr. zur Strassen has begun the operation and separates the northern species which contain the type, from the tropical and southern forms on the ground that in the type species the mouth parts are concealed from a lateral view, and that the dactyli of the anterior pereiopoda are comparatively very small. In the southern species the mouth parts are distinctly visible from a lateral aspect, and the dactyli of the anterior pereiopoda are large. For these the genus *Antarcturus* is instituted, and this contains the greater number of species. It is probable, however, that it is only a temporary delay in the further breaking up of the original genus, and if this alteration is to be carried on, minor characters, such as the

absence of cephalic horns, may be found which will assist in further dividing the original genus; but, unless these divisions are indicated by some prefix to the name *Arcturus* so as to show what has become of closely related forms, no advantage can accrue to zoological nomenclature.

Antarcturus adareanus.

(Plate V., fig. 1.)

Arcturus adareanus Hodgson (**8**), pp. 249–250.

Specific characters :—

A small spine at the antero-lateral angle of the cephalosome, and a pair of stout spines behind the cephalic horns.

Two dorso-lateral spines on the first segment of the mesosome.

This species is very closely allied to *A. glacialis* Beddard, but may be readily distinguished from it by the characters given above, and especially by the first named.

The cephalosome has its anterior margin incurved as usual, and its antero-lateral angle terminates in a spine; a minute spine occurs behind this and in front of the eyes. The cephalic horns are not very large, they lie between the eyes and arch slightly outwards. A short distance behind them is another pair of small spines. The cephalosome is otherwise smooth.

The mesosome is covered with small spines throughout. The first four segments progressively increase in length to a slight extent. The posterior margin of each segment consists of a transverse ridge, which, in the case of the first three, widens out laterally to the full length of the segment. The dorsal area in front of the ridges is occupied by two more or less distinct rows of spines. The ridge on the first segment also bears two stout but blunt spines dorso-laterally, and the posterior border of the two following segments at least has a distinct row of small spines, laterally the segments are covered with several small blunt spines. The fourth segment is similarly covered, but here the lateral area is distinct from the transverse ridge. The three posterior segments progressively decrease slightly in length; each has a raised transverse spinous ridge, which, in the case of the first, widens out laterally, both anteriorly and posteriorly; in the case of the other two the ridges are straight anteriorly and widen posteriorly. Small blunt spines are numerous. Laterally the epimera form prominent swellings over the base of their respective appendages and are more or less well supplied with small spines.

The first three segments of the metasome are distinct though fused and covered with the same small spines. The epimera are comparatively large, roughly ovate structures, decreasing in size from the first to the third. The urosome is rounded, and at its extremity bears two prominent straight spurs. Its surface is covered with small spines which are seen to be in rows. A median row of small spines, a row of larger ones on either side and two other rows less distinct. The uropoda are large, the basal

joint has three rows of spines along its centre, its extremity is truncated and carries the very small pointed terminal joint.

The above description is taken from a rather small male. The female differs considerably in the anterior part of the body. This, as is usual with all members of the genus, is considerably swollen, a fact which of course involves the proportions of these segments. The spinous armature of the body is much more strongly developed, the small spines are rather larger and much more numerous; the first segment of the mesosome has a pair of dorso-lateral spines which are conspicuously larger than the rest, and on the second segment there is one smaller than on the first, on the third segment also, and that not very much larger than the surrounding ones.

The epimeral spines are generally more developed, and at the base of the fourth pair of appendages there is a stout spine directed to the mid-ventral line. This is not present in the male, and is apparently a secondary support to the brood pouch, which is composed of four pairs of oostegites.

The first antenna is of normal type. The first joint is stout, with a blade-like expansion along its inner margin. This is covered with minute stiff setæ. The second joint is not so long and slightly swollen towards the distal extremity, the third is sub-equal in length and cylindrical, and the flagellum, which carries some sixteen tufts of specialised setæ, is rather longer than the two preceding joints together.

The second antenna has, as usual, the two first joints extremely short, the proportions of the remainder with the flagellum are 4. 8. 10. 8. The third joint has a series of stout spines along its outer border and long setæ on the inner ventral border; the next joint is similarly provided, but here the spines are smaller and diminish to nothing during its proximal half. The last joint, a flagellum, bears small setæ, but these are not thickly distributed.

The mandible is massive and thickly pigmented with arborescent chromatophores. About half its length it is bent at a right angle. Its anterior margin is prolonged as a toothed edge; it bears two teeth, and passing obliquely backwards from the most anterior of these are two quite small ones; the posterior edge of this part is another very prominent tooth, and below this again is a group of spines arranged somewhat radially. The cutting edge is straight and broad.

The first maxilla comprises two lobes, the inner one, short and slender, slightly curved with fine setæ along its inner margin; its truncated extremity bears three stout spinous setæ with fine ones along them, rendering them coarsely plumose. The outer joint is stouter, double the length, with fine setæ externally and terminates in a crown of nine or ten stout spines.

The second maxilla has its inner lobe short and broad, with fine setæ along its internal margin. Distally the extremity is rather rounded and armed with plumose spines. Three of these plumose spines on the outer side of this lobe are much finer than the others. Of the two lobes the inner one is the smaller and terminates with three long slightly plumose spines. The outer lobe is much stouter and carries five of

these plumose setæ, but here they vary in length, and on both lobes the plumose structure exists only at the base, distally they become finely toothed.

The maxilliped does not exhibit any special features. The basal joint is short with the outer angles, particularly the anterior one, rounded. The masticatory lobe is long, two-jointed, the inner margin straight throughout, but the outer margin of the distal joint rounded. The distal margin is occupied by numerous short plumose spines. The palp is five-jointed, the proportionate length of the various joints being about 3. 3·5. 6. 5. 2. The entire organ is richly clothed with long setæ, more especially internally and distally. With a one-inch objective these are seen to bear a number of fine setæ about the middle of their length. The epignath is carried on a small plate, roughly ovate in shape, but having a flattened edge anteriorly. The epignath itself is a large plate ovoid though flattened on one side; it is just about as long as the masticatory lobe.

The whole of these mouth organs are richly pigmented with black arborescent chromatophores.

The first appendage of the mesosome is quite normal in general appearance, provided with long setæ on its ventral side from the distal extremity of the basis; the merus has both dorsal and ventral margins rounded, the former projecting forwards as a blunt point with a small tuft of setæ; the distal extremity of the carpus projects in a similar manner ventrally. The propodus is by far the largest joint, though not so broad as the merus; the dactylus, including the terminal claw, is about two-thirds the length; the claw has a very stout auxiliary. On the inner face of the propodus long setæ are arranged in eight or nine series; these and a very large proportion of those on or near the ventral margin are very finely toothed.

The three following appendages are provided throughout their length from the distal extremity of the basis with groups of very long and shorter simple setæ. The outer side of the basis carries a series of some half-dozen spines, and the ischium and merus have a dorsal and distal spine.

The three posterior pairs of appendages of the mesosome are strong, the proportions of the joints of the middle one are 5·5. 3·25. 2. 1·8. 5. 4. The basis bears several irregular but stout spinous processes along its dorsal border, the ventral border of the remaining joints, except the dactylus, are fringed with spines, these only develop as such along the ischium, dorsally there are a few scattered setæ of variable length. The dactylus has a few small setæ dorsally, but is otherwise smooth.

Five specimens of this species were taken in 300 fathoms off the Ice Barrier, Bottom Mud, lat. 78. 25. 40. S., long. 185. 39. 06. E. Four of these are females, one scarcely adult, two with ova, and one with numerous young not yet emerged from the brood pouch. In these young the various segments are rendered conspicuous by transverse ridges, but the only spinous armature visible on the entire body are the two posterior horns of the urosome; the cephalic horns are not present.

Antarcturus franklini.

(Plate V., figs. 2 and 3.)

Arcturus franklini Hodgson (**8**), pp. 250–1.

Specific characters :—

A small spine at the antero-lateral angle of the cephalosome.

Two prominent dorso-lateral spines on each of the first three segments of the mesosome; epimeral spines as well. No dorso-lateral spines in the male.

Urosome rounded, covered with small spines, with two slightly divergent terminal spurs.

The original description being quite unsatisfactory, and as I have now more material, I will take this opportunity to redescribe the species.

The body is usually covered with small, irregular chromatophores, which are most definitely arborescent on the cephalosome, which is smooth; its anterior margin is incurved, and just behind the lateral angle is a stout spine. Two strongly developed and pointed horns lie behind the anterior margin and between the eyes.

The three anterior segments of the mesosome are almost smooth, the fourth being covered with small spines; the first three carry a pair of very prominent spines dorso-laterally. The epimera of all four bear a stout spine, and there are also other smaller accessory ones, but these vary. The fourth segment is devoid of the prominent dorso-lateral spines. There is no great difference in the length of these segments, the first two are very nearly, if not quite, subequal, and the two following also, but these are a little longer. The three posterior segments are covered laterally with small spines, a band of them crosses each segment, forming a more or less prominent posterior fringe.

The metasome is also covered with small spines; although all the segments are rigidly united, the two anterior ones are distinct, the third is fused with the urosome; there are no conspicuous spines here other than the two prominent ones which terminate the body; one pair, however, is a little larger than the remainder.

The first antenna is of the normal type; the first joint is short and stout, with its inner margin considerably expanded as a wing-like enlargement, the second joint is but little shorter and spindle-like, the third is but the merest trifle shorter still, and the fourth is scarcely as long as the two preceding ones together, and has nine groups of sensory setæ.

The second antenna is longer than the body; the first joint is very small and scarcely noticeable from the dorsum, the second is longer and its distal border forms two spikes, one each side. The proportions of the remaining joints and flagellum are as 5·5. 14·5. 19. 15. The third joint has four or more prominent spines near its outer border, the following joint also has a series, but they are smaller and diminish to nothing along the joint, which is also covered, but not very plentifully, with small

setæ, and these are plentifully distributed over the rest of the appendage. Nowhere are they conspicuous.

The first maxilla is a two-lobed structure, of which the inner is short, narrow and slightly curved; its inner margin is fringed with fine setæ, and the distal extremity is occupied by three stout, plumose setæ. The outer lobe is much larger and broader, its distal margin being fringed with about ten stout spines.

The second maxilla consists of a broad lobe rounded distally, the inner distal margin is armed with short and stout plumose setæ; towards the outer margin the setæ become longer, more delicate and much less plumose. Of the two external lobes the outer one is half the size of the inner and is armed distally with a few strong setæ, which are thinly plumose, those of the inner lobe are more numerous and intermediate in character.

The maxilliped presents quite a normal appearance. It rests on a broad plate which is nearly rectangular, but rounded on its outer side. The masticatory lobe is in two pieces; the proximal one being a little shorter than the distal, which has its outer margin rounded. Distally it is armed with short, stout, slightly curved setæ, which appear to be finely toothed rather than plumose. The palp does not present any special peculiarity; the first three joints progressively increase in length, the other two decrease; all are stoutly built and are provided in the usual way with long setæ. The epignath rests on a triangular plate of which the angles are rounded and the base is anterior; it is large and unequally oviform, the inner margin being nearly straight.

The first appendage of the mesosome, or gnathopod, does not differ essentially in its structure from that of the other species here described. The basis is stout, constricted near the base and rather irregular in outline; the three following joints are quite normal and plentifully provided with long, simple setæ. The propodus is supplied with long, simple setæ along its ventral margin, but on its inner face, that applied to the body, there are, towards the dorsal aspect, some half-dozen series of long setæ as well as others near the ventral margin, which are finely toothed rather than plumose. A rounded process on each side of the extremity of the propodus receives the dactylus. This is well provided with simple setæ, and the terminal claw is accompanied with an auxiliary more than half its size.

The three following pairs of appendages are fringed with long, simple setæ from the distal extremity of the basis. The first pair is the shortest, the other two subequal, the basal joint of the third being the largest and most spinous, but the three terminal joints are each rather smaller than on the preceding appendage. Externally the basis is provided with four stout spinous processes. The next joint has one very large one; the merus has two, a small proximal one and a large distal one; the carpus has but one of moderate size. The number of these spines only concerns this particular individual, they vary both in number and strength. The centre appendage has a length of 10 mm. on a body length of 20 mm.

The three posterior appendages of the mesosome are not very long, the proportions of the joints being 11. 6. 4. 4. 8. 7. The basis bears four or five stout spinous processes externally, the number and strength of these vary ; the ischium only bears short setæ with which it is fairly well covered ; the merus and two following joints bear along the ventral surface a series of stout spines, in addition to small setæ irregularly scattered. The dactylus is thinly covered with fine, small setæ and has a stout terminal claw and a small accessory.

A number of specimens of this species were taken in Winter Quarters inside the 25-fathom line, and one was taken in 125 fathoms. The average length of the body is 22 mm. Most of the specimens are females and, as one expects in members of this genus, the anterior part of the mesosome is considerably enlarged. Also the development of the spines is much increased, and those on the mesosome from which one of the specific characters are derived become comparatively enormous. There is also an indication of a stronger lateral spine on the third or fused segment of the metasome.

None of the females bear young, many of them have ova ; these were captured in October and February. The males have the dorso-lateral spines very much less prominent, and the body is uniformly cylindrical throughout.

The oostegites of the females number four pairs, and the most posterior pair are supported by a stout spine from the epimeron of the fourth segment of the mesosome which almost reaches to the mid-ventral line, this also bears subsidiary spines.

The species was described from a single small though apparently fully developed female taken off Franklin Island by the 'Southern Cross' Expedition. With that individual were associated three very small and obviously immature specimens. Knowing that the spinous armature increases with age, and more especially so among the females, I declined to regard these as other than possible juveniles of this species.

This turns out to be correct, but the complete absence of large spines in the male led me to regard them as another species which was to have received the name of *A. australis*. It was not till I found that all my specimens of *A. franklini* were females and all those of *A. australis* were males that I discovered the error. It is absurd to suppose that during a residence of two years, and capturing these animals one or two at a time, only one sex of each of two species should be taken. The figures will show the differences between the two sexes, the most remarkable being the complete absence of the larger spines.

The foregoing description of *A. franklini* is based entirely on the females.

In the male the four anterior segments of the mesosome are practically smooth, though rather tuberculated laterally, the first of them bears an epimeral spine. They progressively increase in length, the fourth being half as long again as the first.

The segments of the metasome, though fused, are more distinct than in the female ; two dorso-lateral spines, larger than the rest of those covering the urosome, are sometimes present.

The second antenna differs in the proportion of its principal joints and flagellum, being 3·7. 16·5. 21·5. and 16 as against 5·5. 14·5. 19. 15. of the female on which the detailed description is based. The first of these joints as measured, the third really, is devoid of spines.

About thirty specimens of both sexes were taken in Winter Quarters during the whole of our stay, all, but one, inside the 50-fathom line.

Antarcturus hiemalis.

(Plate VI., fig. 1.)

Specific characters :—

Cephalosome and first four segments of the mesosome each with a pair of stout spines forming a single row on each side of the middle line.

Epimera with very prominent spines.

Mesosome rounded posteriorly and having a median keel terminating in a spine, the third abdominal segment, which is fused with the urosome, having laterally a very stout backwardly curved spine.

Long setæ predominate.

The entire body is marked all over with small arborescent chromatophores. The anterior border of the cephalosome is incurved, and close to this margin is a pair of very prominent horns curved forwards and outwards, these are provided with several very long setæ. Behind this is another pair, much smaller but still prominent, and these also have long setæ connected with them. Abreast of the interval between these two pair of horns lie the prominent and well-developed eyes.

The first four segments of the mesosome are subequal in length, and each is provided with a pair of very prominent spines placed one behind the other on each side of the mid-dorsal line ; long setæ are associated with these. These segments are covered with minute spines, but outside the longitudinal rows they become much more prominent, and while varying in size, form a distinct fringe along the posterior border of each segment, the remainder of which is more or less coarsely tuberculated. The epimera bears one very pronounced spine and other smaller ones. The larger ones are setose.

The three posterior segments of the mesosome are minutely spinous, but as with the more anterior ones the spines are far better developed laterally and also form a strong postero-lateral fringe. The epimera are distinct from these segments and bear very prominent setose spines.

The metasome shows distinctly three segments and the urosome, all of which are fused. The first segment has a very large setose epimeral spine, the second has only a stout tubercle, while the third has an extremely stout backwardly curved spine, its base being as broad as the segment bearing it.

The urosome is rounded posteriorly, scabrous, and having a well-developed median keel which terminates in a spinous blade a little in front of the extremity. The borders are fringed with long setæ.

The first antenna (fig. 1a) conforms to the usual type, the first joint is broad, having a more definite wing-like expansion on its inner side than is usual, and on its outer border a strongly developed spine. The second joint is short, expanding distally. The third is much shorter still, these two together scarcely equal the first in length. The fourth joint is the longest and provided with a dozen tufts of specialised setæ. Every joint bears small arborescent chromatophores.

The second antenna is nearly half as long again as the body, and is fully clothed with long setæ. Of the five joints of the peduncle, the first is very short, the second is longer, and at its ventral extremity bears a very stout spine. The proportions of the four joints of the peduncle and the flagellum are approximately 3. 5·5. 11. 12. 13·5. The three terminal joints of the peduncle are plentifully provided with long setæ, and each joint of the flagellum bears a distal whorl of them as well as a few about the middle.

The first maxilla (fig. 1b) is stout, the smaller and inner lobe has a curved outline, the middle of its inner margin bears a group of long setæ, smaller setæ are plentiful distally, while the extremity is armed with three stout setose spines. The outer lobe, which is more than double the size, bears numerous chromatophores, compact at the base but becoming arborescent distally. The middle of both inner and outer margins is occupied by a group of short setæ, and the distal extremity is armed with eight or nine strong but simple spines.

The second maxilla (fig. 1c) is very broad, decorated as before with chromatophores, compact at the base and arborescent distally. The inner lobe is short and broad, its inner margin provided with fine setæ, distally it bears numerous spinous setæ, each provided with lateral setæ, but these are too short and stiff to justify the use of the word plumose. Of the two outer lobes, the outermost has been broken off in the specimen examined, the other is about one-third the diameter of the main lobe, and like it, it is provided with stout setæ furnished with small and stiff subsidiary ones.

The maxilliped (fig. 1d). The masticatory lobe is two-jointed, and in its entirety has something of an hour-glass shape, being constricted at the junction of the two joints; the distal margin and inner angle of the second joint is fringed with stout plumose setæ. The palp is five-jointed, stout throughout, none of the joints greatly exceeding the others in diameter; the first three joints progressively increase in length, the fourth is as long as the third but more slender, the terminal one is a stout knob. All are liberally provided with setæ on the inner margin, which increase in length to the fourth joint, and are more generally scattered over the first and second, the third and fourth having a distal fringe dorsally. The epignath is conical though not symmetrical, and the greater part of its margin is fringed with minute setæ. The entire appendage is covered with black chromatophores, only a few of which are aborescent; the majority are sharply-defined black spots, but many are irregular in shape.

The first appendage of the mesosome (fig. 1e) is prehensile. The basis is a long

joint approximately cylindrical and having a slight constriction near the proximal end, ventrally it bears a distal fringe of long setæ; the ischium is small and enlarged distally from a slender base; the merus is also short but very broad, almost circular though irregular in outline; the carpus is short, its ventral margin being nearly three times as great as the dorsal. These three joints are together about as long as the basis, and are plentifully supplied with long setæ on their ventral surfaces, and the two proximal ones have a few dorsally. The propodus is very nearly as long as the basis, its dorsal margin is straight with a few long setæ distally, ventrally it is swollen but not to any great extent and thickly fringed with long setæ, and a few are a little further back from the margin; on one side these are long, on the other they are short, and near the dorsal margin there is an irregular band of setæ of intermediate size. The dactylus is stout, but near its termination it becomes rather abruptly reduced in diameter and the claw is accompanied by a small accessory; the dorsal and external face of this joint is very richly supplied with long setæ.

The three following appendages of the mesosome are of the normal type and do not present any special features, they increase in size from the first to the third and the middle one, which may be taken as the type, has a length of 15 mm. compared to a body length of 27 mm.

The three posterior appendages of the mesosome are long. The proportions of the joints of the second are as 11. 7. 4. 4. 7. 5. The basis and the two following joints are covered with small tubercles and have a few straggling setæ, the inner margin of the carpus and propodus bears a row of slender spines, and at the end of the latter joint is a rounded lateral flange which supports the dactylus. This bears a very small accessory claw.

The uropoda are minutely tuberculated and fringed with long setæ. The marsupium of the female is composed of three pairs of plates, connected with the third to the fourth appendages of the mesosome.

This species was found in Winter Quarters at a depth of 125 fathoms. Only three adult specimens were taken; one of these is a female much larger than the specimen described. This specimen is abundantly overgrown with hydroids, polyzoa, worm tubes, etc., chiefly on the antennæ and anterior appendages; among all this were massed not less than sixty young. These are quite devoid of the spines so characteristic of the adult, and only two instead of the three posterior pairs of thoracic appendages are to be detected.

Antarcturus meridionalis.

(Plate VI., fig. 2.)

Specific characters :—

Body slender, second antenna nearly twice the length of the animal, not conspicuously setose.

Cephalosome as well as body quite devoid of any spines except coarse epimeral tubercles on the first four free thoracic segments.

Urosome rounded posteriorly, with a median ridge ending in a spine a short distance from the posterior margin.

The anterior margin of the cephalon is arched forward on each side of the middle line so as to form a more angular cleft than the usual crescentic curve. There are no spines nor any trace of the cephalic horns. Eyes well developed and lateral as usual though not so prominent. Of the segments of the mesosome the first three vary but little, the fourth is about half as long again as the first. These anterior segments all possess a tubercle of varying size on the epimera, and the dorsum is irregularly corrugated.

The two anterior segments of the metasome are long and slender, the fusion of the third with the urosome is more complete than usual and marked laterally by a tubercular swelling of no great size.

The urosome forms the greater part of the metasome and is rounded at the extremity, marked in the middle line with a slender ridge which terminates before the extremity in a blade-like spine.

The first antenna is of the usual *Arcturus* type; the first joint is short but stout, having its outer margin expanded; the two following are subequal and shorter; the last is about five times the length of either of the two preceding, and provided throughout the greater part of its inner border with the normal sensory setæ.

The second antenna is long and slender, measuring some 57 mm.

The first joint is very small and quite inconspicuous; the second is longer, though short, the proportions of the remaining joints and flagellum are approximately as 2. 4. 12. 12. 21. All these joints are rather sparingly supplied with small inconspicuous setæ. The joints of the multi-articulate flagellum are long and slender, each bearing a few small setæ at the middle and distally.

As there is only a single specimen the mouth organs have not been dissected. The maxillipeds, however, as far as can be seen *in situ*, presents no special features; the epignath is about the average size and distinctly conical in shape. The appendage is rather handsomely marked with large arborescent chromatophores.

The first appendage of the mesosome differs but little from the usual type, and is handsomely marked with the same large arborescent chromatophores. The basis is long, furnished ventrally and distally with a fringe of long setæ; the ischium is about half the length; the merus is shorter and nearly round owing to its lateral extremity projecting forward as a blunt point; the carpus is rather cup-like with a larger ventral than dorsal surface; these three joints are well provided with long setæ ventrally. The propodus is large but not greatly expanded, it is liberally fringed with long setæ; the dactylus is stout, considerably increasing in stoutness from the base to near its distal extremity, when the dorsal surface becomes abruptly curved downwards to form a finger-like process, and this bears a stout claw and a smaller accessory; the dorsal surface of this joint is well provided with long setæ, more especially in the area of the "cushion."

The three following appendages are of the usual type; the joints are smooth without spines or tubercles, but the long setæ are simple and arranged in serial

groups. The dactylus, however, has its ventral margin furnished with small close set spines, and instead of the terminal claw there is a group of three large spines.

The three posterior pair of limbs are rather long, graduating in length from first to last; the last is smallest, the middle one is 13·5 mm. in length. The joints are not specialised, except that the carpus has a series of seven or eight stout curved spines on its ventral surface; the propodus is similarly provided, and the dactylus, which is slender, is as long as the propodus and bears a small claw with a smaller accessory.

The specimen is a male, and there is a long median process about 3 mm. long in front of the pleopoda; this is thin, but has a slightly irregular outline and the extremity is rounded; it is cleft for one-third of its length.

The first pair of pleopods have a protopodite about as long as the process above described, the exo- and endopodites are thin plates subequal in size with truncated ends, and these are fringed with long setæ; the exopodite is much the strongest of the two. These have been examined *in situ*.

The single specimen is a male, and was taken in 300 fathoms off the Great Ice Barrier, Bottom Mud, January 27, 1902.

GLYPTONOTUS.

This genus was established by Eights about 1852 for a large species captured in the South Shetland Islands. It subsequently received other species, but these have, for some time past, been transferred to other genera, and the following species, first found on the French Antarctic Expedition, is the only other one that can be now assigned to it.

Glyptonotus acutus.

(Plate VII.)

Glyptonotus acutus Richardson (12), pp. 10–13.

Specific characters :—

Body more than twice as long as broad.
Sculpturing exactly as in *G. antarcticus*.
Urosome longer than broad, terminating in a prolonged spike.
Legs very long and slender.

Cephalosome is comparatively small, rounded posteriorly, being largely recessed into the first segment of the mesosome. The anterior margin is formed by two shallow crescentic depressions, above the origin of the antennæ these depressions are united in the middle line by a stout tubercle, and a smaller one occurs at the external border; from this the margin of the cephalosome slopes obliquely backwards to the posterior rounded margin in a slightly sinuous line.

The eyes are quite small, ovoid, and dorso-lateral in position; they lie on an oval swelling separated from the rest of the lateral plate by a shallow groove. The

surface of the cephalosome is sculptured in a peculiar way, but only differing in the minutest detail from that of the type species, *G. antarcticus*; two flattened patches occur behind the crescentic depressions of the anterior margin; immediately behind these is a transverse band more coarsely knobbed and posteriorly divided into four distinct tubercles, the outer ones being at least half as large again as the inner ones. This entire sculptured area is separated off from the "lateral plate," where the eyes are situated, by a conspicuous dermal fold, which reaches to about the centre of the level of the eyes.

The mesosome comprises the normal seven segments, and of these the fourth is the largest; the differences between any of them are, however, not great. All of them show a mid-dorsal longitudinal ridge more or less strongly developed. The sculpturing comprises a roughly triangular patch, its apex directed to the middle line. These patches are comparatively smooth on the third and fourth segments, but increase in roughness anteriorly as well as posteriorly.

The first segment arches forwards to partially enclose the cephalosome, a smooth dermal ridge runs round this segment and forms its anterior margin to a certain extent, but in front of it for a short distance either side the middle line is a thin band of irregular sculpturing. The three posterior segments are curved backwards, the curvature increasing progressively to the last which, with its epimera, completely hides the lateral margins of the two first segments of the metasome.

The epimera are large, smooth, the first three having their angles rounded; the posterior angle of the fourth is pointed. The epimera of three posterior segments are conspicuously separated from the segment bearing them; they become narrower, longer, and more acute from first to last.

In appearance the cephalosome and metasome are exactly like those of *G. antarcticus* Eights, the only difference being one of proportion.

The metasome comprises four free segments, visible dorsally, and a fifth, fused with the urosome, and this last is the longest; of the other four, the two middle ones are subequal in length, as are the first and fourth, which are a little shorter. The last segment of the mesosome conceals the lateral margins of the first, and its epimera hide, but not altogether, the diminutive epimera of the second segment; the epimera of the other two segments progressively increase, the last being large and directed backwards. The urosome has the fifth segment fused with it, and this irregularly tuberculated, and has a prominent mid-dorsal ridge; the urosome itself is long, comparatively slender, having a sinuous tapering margin and terminating in a strong and rather lengthy spine, the end of a well-developed median ridge.

Ventrally the fourth to sixth segments of the mesosome are conspicuously grooved in the middle line, and traces of such a character occur on all.

The oostegites are five pairs, and occur on the first segment to the fifth. In the largest female, which is the specimen examined in detail, they are not fully developed, and are strong ovoid structures which do not reach anywhere near the mid-ventral line.

A larger specimen, 119 mm. long, is a male, but this was dead when found, and, besides some injury, its inside had been almost completely eaten out. On the anterior border of the first segment of the metasome are a pair of penial filaments; these are cylindrical, about 5 mm. long, and terminate in an oblique orifice surrounded by a fringe of stiff setæ. A further sexual character is the long, slender, grooved filament connected, at its base only, with the endopodites of the second pair of pleopoda. It is half as long again as its endopodite.

The first antenna arise rather close to the middle line, and comprise a peduncle of three joints; the first two are subequal in length, and the third is nearly as long as the first two together. The first is slightly contracted in the middle, and has a group of stout setæ at its inner distal extremity; the second has a small group about the middle of its ventral border, as well as a distal fringe, which is, however, irregular, being most accentuated ventrally. The third joint is more slender, swollen, and setose distally. The flagellum is not as long as the third joint of the peduncle; it consists of a single joint, strongly curved near the proximal end, and has a band of fine setæ running along its outer border.

The second antenna arises immediately outside the first; the peduncle is five-jointed. The first joint is extremely short, the next two are subequal in size, the second having a strongly developed distal fringe ventrolaterally, and the third has a ventral mass of setæ rather than a fringe; the fourth joint is a little longer than the preceding, and, like it, widens distally; it has a well-developed dorsal distal fringe and a mass ventrally which is separable into two groups; the fifth joint is nearly as long as the third and fourth together; it carries along the distal half of the ventral margin four groups of setæ, besides a dorsal and ventral distal fringe. The flagellum is multi-articulate, and half as long again as the peduncle.

The buccal mass is very prominent; the supporting plate in front bears three tubercles, of which the median is very prominent. The epistome is an irregularly ovoid plate with a raised edge, and cleft in the middle.

The mandible is large and powerful, devoid of a palp; the cutting edge of that on the left side is strongly coloured, and overlaps that of the right.

The first pair of maxillæ (fig. 2) consist of the two normal lobes, the inner one considerably smaller and weaker than the other. The inner one terminates with three rather long and strong setæ and several others, much weaker; very minute setæ occur on both faces of the joint. The outer lobe, at least twice the length and breadth of the inner, has eight strong spines distally, and its outer border is fringed with minute setæ.

The second pair of maxillæ (fig. 3) are broad, if thin. The inner lobe is constricted about its middle, and then forms an ovoid enlargement. The inner and distal border of this is furnished with long slender setæ; the two outer lobes are very nearly equal in size; they are rounded distally and provided with long slender setæ; fine setæ occur on the outer border and the base of the external lobe.

The maxilliped (fig. 4) is large and strong. The basal joint is broad and stout, the

distal joint more than half the length, angular distally, and provided with a large number of thick setæ; the inner edge of this joint bears a group of fine setæ, of which two are larger and stronger than the rest, and both are thickened so as to form a broad wall rather than a narrow edge; this more particularly is the case with the basal joint. The palp is five-jointed and large; the first three joints progressively increase in length; the remainder decrease, but in no case is the difference great. Both the third and fourth are enormously expanded internally, each as a flattened plate with more or less rounded angles. The fifth joint is stout, but digitiform, almost surrounded with setæ, which increase in length to the distal extremity. The first joint only bears a few short setæ; the second, third, and fourth are richly setose internally, the third and fourth bearing short setæ externally as well. The epignath is a broad plate about the length of the basal joint.

The first three appendages of the mesosome are prehensile in function and exactly alike except in so far that they increase in size from the first to the third; the remaining four are ambulatory, exactly alike, and also increase in length from the fourth to the seventh.

The first appendage (Pl. VII., fig. 5) has a long basis, nearly as long as the four following joints, and carries a small tuft of spinous setæ ventrally at its distal extremity. The ischium is about half as long, and has two tufts of spinous setæ ventrally; it has a small external process which extends the articular surface. The merus is a very short joint with a large dorsal expansion which partially covers the succeeding joint and extends beyond the insertion of the propodus. This expansion terminates in a tuft of spinous setæ, and the ventral aspect of the joint, here very short, bears two groups of similar setæ on the inner side, and only one, which is smaller, on the other. The carpus is short and broadens dorsally, where it is very largely covered by the preceding joint; ventrally it carries three double series of stout setæ. The propodus is broad, rounded dorsally, nearly as long as the three preceding joints; the ventral margin appears as if serrated, and bears seven double groups of stiff setæ. A few short setæ occur dorsally at the distal extremity; the dactylus is slender, the point reaching as far as the carpus.

In the last appendage of the mesosome the proportions of the joints are 15. 9. 6. 12. 12. 6. The basis has the external articular process well developed, beyond which it is constricted; a flange runs along the ventral surface of this joint, to open out midway along it to form a protective shield for the base of the next joint. There is a small distal fringe dorsally. The ischium and succeeding joints are triangular in section, being flat ventrally. The dorsal ridge produced by this shape opens out on this joint to permit the more complete flexure of the succeeding joint and is armed with three groups of spinous setæ, five groups of such setæ occur ventrally. The merus has three and projects dorsally over the base of the carpus; the carpus has seven such groups and a distal fringe; the propodus has five, which more nearly approach transverse bands; there is also a short distal fringe dorsally. The propodus is long and slender.

The uropoda are large and opercular ; a prominent ridge runs round the structure on all sides except the distal extremity ; anteriorly and internally this ridge is some little distance from the edge and terminates in a point. The distal extremity is incurved and supports a pointed ovoid exopodite.

The endopodite is smaller, more regular in shape, and concealed by the exopodite.

The pleopoda are all very much alike ; the exopodite and endopodite are elongate lamellæ, the former a little the shorter ; both have setose margins. The sexual modification of the second pair in the male has already been alluded to.

Six specimens were taken at various times, in Winter Quarters, at depths varying from 20–125 fathoms. The largest of these was a dead male measuring 119 mm. in length and 42 mm. across the third segment of the mesosome. The smallest was not more than 13 mm. long. In the small specimen the mid-dorsal ridge is relatively more prominent, the metasome is proportionately longer, and the posterior band of sculpturing on the cephalosome is more strongly developed.

In life they are of a dull brown colour and of sluggish habits.

NOTASELLUS.

Instituted in 1886 by Dr. Pfeffer for a species taken in South Georgia, this genus now contains two species.

Notasellus australis.

Notasellus australis Hodgson (8), pp. 251–3 ; Richardson (12), p. 13.

Specific characters :—

Uropoda bi-ramous, longer than the urosome, which is approximately as long as broad, and terminates in a small rounded lobe between them.

Two specimens of this species were taken at Cape Adare from the root of a large Laminarian, *Lessonia grandifolia*, in 17 fathoms, February 24th, 1904.

It has also been taken by the French Antarctic Expedition in the neighbourhood of Graham's Land, the western side.

AUSTRONANUS.

Body ovoid, without distinct waist between any of the segments.
Cephalosome large, with stout lateral projections bearing the small eyes.
Second antenna. Peduncle 5-jointed.
Mesosome. Segments very uniform in structure.
Metasome, a single joint—the urosome.
Pereiopoda, all ambulatory.
Uropoda, minute, preterminal,* a single setose joint.
This genus is quite distinct from any other hitherto recorded, superficially at least,

* Notwithstanding my protests the author insists on the use of this neologism.—Ed.

it seems to resemble *Jæropsis* Koehler more closely than any other, though the structure of the second antenna and the uropoda should exclude it from the Janiridæ as at present defined.

Austronanus glacialis.

(Plate VIII., fig. 3.)

Specific characters :—

Cephalosome broad, rather pointed anteriorly.
Second antenna, second joint produced externally as a flattened blade.
Urosome with ten recurved teeth in front of the preterminal uropoda.

This is the most diminutive species in the whole collection, and is of ovoid form.

The cephalosome is large, with the lateral projections which carry the eyes scarcely as broad as the first segment of the mesosome. The ocular projections are very stout though not very long, their angles are rounded, and the eyes, which are red in colour, are quite small. Anteriorly the cephalosome is arched forwards in rather a pointed manner, and its anterior border is flattened. In length it is equal to that of the first two segments of the mesosome.

Of the mesosome the first two segments are subequal in length, the first is curved forwards, the second is the widest, and, with the third, straight; the remainder progressively decrease in length and in width, all of them being more or less curved in a backward direction. The epimera, not separable from the body, are almost the full length of their respective segments, with rounded angles, and a distinct space between each segment; there is no " waist " between the fourth and fifth segments.

The metasome comprises only a single plate, the urosome. This is slightly wider than the last segment of the mesosome and attached to it along half its width. The external margins, as far as the insertion of the small uropoda, are rounded and armed with ten flat curved teeth, which increase in size as far as these appendages; between the uropoda there projects a rounded lobe.

The uropoda are short, single-jointed stumps, setose at the extremity.

The first antenna is short, and has a peduncle of two short joints and a flagellum of five.

The second antenna has a peduncle of five joints; of these the first is small, the second is large and much dilated externally, the third is short, the fourth twice as long, and the fifth rather more than the length of the two preceding. The flagellum only contains about seven joints, and is scarcely twice as long as the last joint of the peduncle.

The mouth organs cannot be detected without dissection, and this has not been done as there is but a single specimen.

The first of the pereipoda is stout and a little shorter than the others. The basis and ischium are two stout joints, the latter not so long as the former, but details cannot be seen without removal from the body. The merus is short and enlarged dorsally in a rounded manner, overreaching the base of the carpus. The carpus is

stout, with a flattened ventral edge armed with a couple of spines. The propodus is stout, nearly as long as the dactylus, with a somewhat flattened edge ventrally and armed with a spine. The dactylus is rather stout at the base, tapering and curved, with a spine or accessory claw about the middle of its length ventrally. The remaining pereiopoda are much more slender, subequal in size, and comparatively small; the distal joints are cylindrical, and there is a stout curved seta on each dactylus.

Only a single specimen of this species was found among the dredge material in February, 1902, before the ship was frozen in to Winter Quarters, inside the 20-fathom line.

AUSTROFILIUS.

Cephalosome three lobed, the median one forming a broad rostral plate, the lateral ones flattened and bearing the small eyes.

First antenna small.

Second antenna, six-jointed peduncle, third joint with an external spine.

Mesosome having its segments variable, but not distinctly divided into two divisions.

Metasome forms a single plate with small preterminal biramous uropoda arising ventrally.

Pereiopoda all ambulatory, of moderate length.

Austrofilius furcatus.

(Plate VIII., fig. 2.)

The cephalosome is not quite so broad as the first segment of the mesosome, and over all it is about as long as the first two segments. The anterior part is reduced to nearly half the diameter of the posterior, and tapering slightly it terminates in two stout but widely separated spines. The antennæ arise in the rounded depression on either side of this rostrum, if such it may be called. The eyes are small and dorso-lateral in position, borne on small rounded tubercles.

The form of the mesosome is not easy to describe; briefly, the six anterior segments are separated from one another by conspicuous bands of dermis softer than that which makes up the bulk of the segment. The first three progressively increase in width, though only slightly, the remainder decrease in a similar way.

The first segment is the longest, and is slightly curved forwards and of uniform length throughout. Referring only to the harder parts the second is little more than half the length in the mid-dorsal line, but increases laterally to be subequal in length; the third is intermediate in length, curved forwards laterally; the fourth is straight. The lateral margins of all these segments are more or less rounded and setose. The fifth segment is the shortest, widening laterally, and not setose; the sixth and seventh

progressively increase in length, the former having a sinuous posterior border and rounded lateral margins, setose as the more anterior ones, the latter is curved slightly backwards, the lateral margins curved and setose, and the posterior sinuous. Intervals of varying width exist between the segments.

The metasome consists of a single plate, the urosome, which is attached by about one-third of its width; it enlarges rapidly to its full width very little less than that of the preceding segment; it is broadly cordate in shape; the antero-lateral margins bear small setæ, and are in part very finely and sparsely serrate.

Three small teeth occur in front of the uropoda, which are of moderate size, ventral in origin, and preterminal in position. They comprise a single-jointed protopodite with a small single-jointed exopodite and endopodite. The former is about two-thirds the length of the latter and much more slender; each bears a tuft of long setæ and a few along both margins.

The first antenna consists of a peduncle of two joints, the first of which is stout, the second longer and more slender; the flagellum is small, little longer than the second joint of the peduncle.

The second antennæ are destroyed in the specimen figured, four joints of the peduncle remain; all are short, and the third of them carries externally a spinous appendage. In another smaller example the second antenna is complete and shows two more joints, long and stout, the distal one longer than the proximal and a little more slender; both are covered, but not thickly, with fine setæ. The multi-articulate flagellum is about as long as the terminal joint of the peduncle; it is well provided on the inner side with specialised setæ in small groups.

The mouth parts are quite normal as figured on Plate VIII.

Of the pereiopoda the first is the shortest and a little the stoutest, the remainder are approximately subequal. They do not present any special features save that the terminal claw is well developed and accompanied by an accessory which is very nearly as large.

The pleopoda. The first pair are opercular.

Four specimens were obtained from the dredge material during February, 1902, taken inside the 20-fathom line. The largest is 3 mm. long.

COULMANNIA.

Cephalosome narrower than any segment of the mesosome except the last; the eyes are small and borne on elongated lateral peduncles.

Second antenna with a six-jointed peduncle, no accessory appendage on the third joint.

Mesosome without any conspicuous division between anterior and posterior portions.

Epimera not distinct from mesosome, prolonged and deeply cleft. Segments spinose in mid-dorsal line.

Metasome with one distinct segment spinose and a bulbous urosome with minute preterminal uropoda.

Pereiopoda ambulatory, except the first, which is prehensile.

Pleopoda, first pair forming an operculum over the remainder.

This genus is established for two closely allied species which cannot be located in any existing genera. It is unquestionably a member of the family Janiridæ and its nearest relations would appear to be the genera *Iolanthe* Beddard, and *Iolella* Richardson.

Coulmannia australis.

(Plate IX., fig. 2.)

Specific characters :—

First segment of mesosome with epimera cleft to form two blade-like processes.
Urosome pointed.

The body is 5 mm. long, vaulted with the elongated, though not separable, epimera of the mesosome divided by a deep and wide cleft so as to produce them as narrow blades. Each of these segments as well as the first of the metasome bears a slight ridge produced in the mid-dorsal line into a stout backwardly curved spine. The entire body is covered, but not thickly, with fine setæ.

The cephalosome is a little longer than the first segment of the mesosome, rounded in front and having, near the posterolateral angle, a slender finger-like process which carries a small eye. The posterior margin is very nearly straight.

The first four segments of the mesosome are subequal in length, the third is the widest, and the epimeral blades of this and the succeeding are subequal in size, those of the first two segments graduate from the first to the fourth. The mid-dorsal spines are well in front of the posterior border of their respective segments. The last three segments are more or less curved backwards, particularly the last, though in the last segment it would be more correct to say angulated. Their dorsal spines are on the posterior border of their segments. The first and only distinct segment of the metasome is quite small and wedged in the curvature of the preceding one. Its mid-dorsal spine, though not so large, is quite as prominent as any of the others. The urosome is smooth, finely setose and peg-top shaped.

The uropoda are quite small, single jointed finger-like processes with a few distal setæ. They lie at five-eighths of the length of the urosome.

The first antenna arises just in front of the eyestalk. The peduncle consists of two small joints, and seen from the dorsum these are subequal in length, though the first is very much stouter than the second. The multi-articulate flagellum is twice the length of the peduncle, and is composed of joints of very variable length and almost devoid of setæ.

The second antenna is longer, and has a peduncle of six joints. The first two are extremely short; the third is longer than the two first together, swollen externally and setose; the fourth is short, forming a sort of elbow in the appendage; the other two

are comparatively long, subequal, and provided with scattered setæ. The multi-articulate flagellum is scarcely as long as the peduncle.

The maxilliped (fig. 2a) has a comparatively stout basal joint and a distal masticatory obe about three-quarters of its length. The entire inner margin is straight, and not far from the base of the masticatory lobe are two papilliform teeth separated by a distinct interval. The distal extremity of this lobe is straight and its outer margin rounded. At the extremity and below the edge are three broad, denticulate spines. Three more, situated externally, are apparently simple; but this is due to their being seen sideways. The palp is five-jointed. The first three progressively increase in breadth, the first being very short, and the next two subequal in length, both these are setose on their inner margins, and the larger ones on their distal external borders also. The two terminal joints are comparatively slender, subequal in length and setose distally. The epignath is large, conical. A small rounded base, bulging considerably to terminate as a cone, it reaches nearly to the end of the masticatory lobe.

The pereiopods are not of any great length, and are very much alike throughout. The first pair only is modified to any extent. This is short, the basis is the longest joint. The ischium is about half the size. The merus is shorter still, but dorsally it is carried as a spine over the carpus for fully half its length, the carpus itself being rather swollen ventrally and proximally, having two or three stout spines about its centre. The propodus is stout and but little shorter, and also carries a few spines ventrally. The terminal claw is stout, the "nail" is distinct, and has a small accessory. The remaining pereiopoda are very much the same, only longer and much more slender. This involves an increase in the length of some of the joints, and the carpus and propodus are the most affected. In the two posterior pairs the merus forms a pronounced dorsal lobe over the base of the carpus.

The first pair of pleopods forms a stout operculum over the remainder, and together form a rather narrow band, which widens out about two-thirds of its length, from thence it tapers to a blunt point; the margins are setose.

As only a single individual of this species was taken, I have been unable to go into any very great detail. The maxilliped of one side has been removed for examination, but that is all.

Coulman Island. 100 fathoms. Stony ground. February 13, 1902.

Coulmannia frigida.

Specific characters :—

First segment of the mesosome with only one epimeral blade.
Urosome prolonged as a distinct spine.

During the progress of this Report an Isopod was sent me from the British Museum which had been found clinging to the body of *Colossendeis frigida*. This specimen I at first thought to be identical with the preceding, but a very brief examination shows that it is quite distinct.

In general appearance this species greatly resembles the last, but it is instantly recognised by the fact that the first segment of the mesosome has its epimera produced into a single narrow blade only.

The cephalosome is rounded, narrower than in the Coulman Island species, which is figured on Plate IX., and the ocular peduncles are shorter and stouter. They do not reach to anything like the distance of the epimera of the first segment of the mesosome.

The mesosome is more distinctly setose than in the last species. The dorsal ridges, with their median spines, are more strongly developed. The urosome is, in its distal portion, prolonged into a definite terminal spine, and is densely setose. Both pair of antennæ appear to be very similar to those of the preceding species.

The pereiopoda are similar. The first pair are short and stout, prehensile in function, the basis is rather long, the ischium not half the length, and the merus shorter than that. This joint is expanded dorsally over the base of the carpus, and carries several stout setæ. The carpus is a stout joint, swollen ventrally and armed with setæ and two or three spines. The propodus is scarcely as long, stout and setose ventrally. The dactylus has a stout base, a comparatively slender claw, with an accessory spine and two curved setæ.

The remaining pereiopoda are distinctly ambulatory in function and have the normal cylindrical joints, excepting only the merus, which preserves its peculiar character and carries a spine dorsally. The carpus is stout and slightly swollen dorsally, with one or two spines and a few setæ ventrally, and the propodus is longer, more slender and slightly curved, with a few setæ ventrally. The dactylus retains its accessory spine and two curved setæ throughout.

There is but a single specimen of this species, taken at Winter Quarters in 125 fathoms.

NOTOXENUS.

Body much vaulted anteriorly, widening conspicuously to the third segment of the mesosome.

Cephalosome rounded, smooth, with long and slender ocular peduncles. Eyes very small.

Antennæ. Second pair with a peduncle of six joints, no accessory appendage.

Mesosome. First four segments straight or very nearly so, three posterior segments recurved. No special interval between any of them. A mid-dorsal spine on each.

Metasome. One very small segment and a large urosome with diminutive pre-terminal uropoda.

Pereiopoda. The first prehensile, the remainder ambulatory, not unduly long.

This genus is closely allied to *Coulmannia* of this Report, in fact I have long hesitated about separating them, but the bodily form which should be of greater importance than variation among the appendages, I think, quite justifies the course adopted.

Notoxenus spinifer.

(Plate IX., fig. 3.)

Specific characters :—

Cephalosome rounded, with long ocular peduncles ending in four small knobs surrounding the eye. Mesosome with mid-dorsal spine on each segment and also on first segment of metasome. Lateral extremities of every segment very distinct from each other.

Urosome very nearly as long as six segments of the mesosome. Top-shaped, with diminutive preterminal uropoda.

The body forms a pointed oval and is much vaulted anteriorly or round-shouldered. The interval between the third and fourth segments of the mesosome is a variable feature, but in no case is it specially conspicuous.

The cephalosome is subcircular when seen from above, but at first sight it does not appear to be so owing to the foreshortening due to the curvature of the body. The eye-stalks arise laterally, they are slender and extremely long, nearly as long as the diameter of the cephalosome, and extend that structure beyond the first segment of the mesosome. They are slightly enlarged at the extremity, and the eye lies in the middle of four small, blunt lobes.

The mesosome comprises seven distinct segments, in the first of which the cephalosome is to some extent embedded. The next three segments are straight, the third of the entire series being the widest. The three posterior segments are curved backwards, their curvature increasing as their diameter decreases. All the segments are provided with a backwardly curved spine in the mid-dorsal line, their size is proportionate to the size of the segment, but their position varies, those of the last three being on the posterior-border of their respective segments. The epimera are inseparable from their respective segments ; they are large and irregular in shape. Those of the first three segments are more or less directed forwards and to some extent rounded at the extremity, the fourth is more truncated, those of the last three are rounded.

The metasome consists of a single segment, wedged in the curvature of the last segment of the mesosome, and the urosome ; the former carries a mid-dorsal spine. The urosome is pointed, pegtop-shaped, more than one-third the length of the entire animal, with small preterminal uropoda. Its entire margin is fringed with small, rather coarse setæ, and its surface is also well covered.

The uropoda are very small, single-jointed, with terminal setæ. The entire body is rather sparsely covered with small setæ ; these are more abundant and conspicuous on the epimera.

The first antenna has a peduncle of two joints, the basal one being quite twice as long as the other, both are setose distally ; the flagellum is about twice as long as the peduncle and has only four joints, the first being rather long.

The second antenna has a peduncle of six joints ; of these the first two are very short, especially the second ; the third is as long as the two together ; the fourth is

about half the length of the third and forms a bend in the direction of the appendage. The two terminal ones are large and slender, the distal one being a little the longest. The peduncle bears numerous scattered setæ. The flagellum is scarcely as large as the two terminal joints of the peduncle.

The mandible is curved and rather tapering, it terminates in a cutting edge with two stout teeth, one of which, the lower one, is lobed; below these teeth are four or five spines which have their distal portions converted on one side into a thin finely serrated blade. The molar process which arises from the base of the organ, and is almost as large, is slightly constricted in the middle; the distal extremity is strong and has a curved process or tooth anteriorly. The palp is a comparatively delicate structure of three joints, the proximal two are subequal in length, the third is little more than half as long and terminates in a pectinate claw.

Both pair of maxillæ are quite normal.

The maxilliped (fig. 3a) is also normal in structure, the straight inner edge of the masticatory lobe bears two papilliform teeth, the distal extremity is straight and armed with setæ, three at least of these below the edge are broad and finely denticulate, exactly like the denticulate spines on the ovigers of so many Pycnogonids, the others are simple. The outer margin is rounded to some extent. The palp is five-jointed, the second joint being by a little the largest. The first three are broad and the two large ones have a few long setæ on their inner margin, and the other two joints are cylindrical with setæ distally. The epignath is large, rather more than three-quarters the length of the entire masticatory lobe, it is somewhat conical in shape, attached at the inner lower angle.

Pereiopoda. The first pair are short and stout, here the basis is long and cylindrical, the ischium is just half the length, the merus about half this, but enlarged dorso-ventrally and with setæ distally. The carpus is about half as long again as the merus, swollen ventrally and armed with three stout teeth and the stumps of one or two more. The propodus is rather short, stout and curved and bears several setæ, the stronger ones are ventral. The dactylus is long, slender, and has an accessory claw.

In the remaining pereiopoda the joints vary a little in their proportions, but there are no structural differences between them. All the joints are cylindrical except the merus, which is swollen dorsally. The carpus is elongated and armed ventrally with three or four spinous setæ. The propodus is curved slightly and carries a few strong setæ dorsally and ventrally, the strongest being ventral. The dactylus, long and slender, has a small if stout accessory claw, and between it and the terminal claw is a long seta.

The first pair of pleopoda form an operculum over the remainder in the female. The sympodite of the male is a narrow structure; the outer margin is curved gently outwards for about two-thirds of its length, it then tapers to a point. Against the exterior curvature is seen the ovate exopodite of the succeeding pair.

Several specimens were taken from sponge débris and other dredge material at intervals during our stay at Winter Quarters inside the 25-fathom line, 1902 and 1903.

HALIACRIS.

This genus was established by Dr. Pfeffer in 1886 for specimens obtained in South Georgia. It is very much open to question if it is distinct from *Munna*. I think not.

Haliacris antarctica.

Haliacris antarctica Pfeffer (**11**).
Haliacris australis Hodgson (**8**), pp. 253–4; Richardson (**12**), p. 16.

This species was very abundant in Winter Quarters, and was continually being taken in the dredge and D-net throughout our stay. As might be expected, the friction they enjoyed in either of these implements was such as to more or less completely dismember them. In consequence only a very few specimens were obtained in a sufficiently satisfactory condition to justify preservation. In the summer, however, we could manage better; the D-net was always kept on the sea bottom, and also always hauled to the surface before use to be certain that it was properly "set." Although the temperature was below freezing point, the weather was generally bright and warm, and these animals were often found wandering over the net or its frame. It was therefore a comparatively simple matter to pick them off and place them in a special pot, so that the majority arrived at the ship in a satisfactory condition. From the material thus obtained I have been able to examine this species in greater detail than hitherto. The description in the 'Southern Cross' Report is little more than worthless. There cannot be any doubt that the species there described is identical with that of Dr. Pfeffer taken in South Georgia. The 'Discovery' specimens also belong to the same species, and it is now seen that there is a sexual dimorphism, the old males modifying the shape of the urosome to a considerable extent. That this is due to age is certain, none of the smaller specimens have a urosome of such a shape, it is only found in the old males, some of which attain a length of seven millimetres. In these the posterior pereiopoda are of extreme tenuity. In life these animals are slow of habit; they crawl about with the metasome directed upwards, which seems to be its normal position. In colour they are a mottled-brown.

Cephalosome broad, as long as the first two segments of the mesosome, considerably reduced anteriorly to form a broad rostral plate; on each side of this is a curved recess terminating externally in a curved spine in front of the eyes. The eyes are comparatively large, on lateral processes which are slightly constricted at the base. The posterior margin of the cephalosome is rounded, and the rostrum fringed with small setæ.

Mesosome. Four anterior segments differing very little in breadth, first and

fourth shortest, subequal in length; the second and third also subequal, but little longer. All straight, the first partially enclosing the cephalosome. The three posterior segments subequal in length, increasing in curvature and decreasing in breadth to the last. Lateral margins of all the segments more or less truncated, the first three obliquely so, and all with distinct epimera, triangular in shape.

Metasome, a single small segment wedged in the curvature of the preceding segment, and a urosome, large vaulted, fringed, but not thickly with spinous setæ, and which form two small groups distally. Ventrally it forms a pocket for the pleopoda. In shape the urosome varies largely, in the smaller specimens it is ovoid with a slight depression for the reception of the diminutive uropoda. In the old adult males it becomes globular, with a truncated projection distally armed with two small groups of spines.

The males resemble the females, except that the latter are very much broader and the mesosome ovoid.

First antenna, the short peduncle is two-jointed. The first joint is short and stout, the second is slender and a little longer; the multi-articulate flagellum is about half as long again as the peduncle.

Second antenna, very long, peduncle six-jointed. The first three joints are very short, the second being as long as the other two together, and constricted in the middle; the other three joints are long, the fourth is long, the fifth much shorter and armed distally with a spine; the sixth is simply enormous, longer than the two preceding together. It is very slender, and provided with setæ throughout. The multi-articulate flagellum is longer than this joint.

Mandible. Strong, curved, cutting edge with two long teeth anteriorly, a third with which is associated a group of spinous setæ. Molar tubercle very prominent, its edge produced to a fine point posteriorly. Palp three-jointed, second joint a little the longest, the other two subequal; the second joint has two, and the terminal one three or four stout setæ armed with very fine closely set teeth.

First maxilla. Normal, the inner lobe terminates in three spinous setæ and a smaller one; these are coarsely plumose, at least on one side. External to these is a group of finer setæ. The outer lobe has about ten stout pectinate spines distally, another row of them internally, a short distance below. A group of much finer ones occurs on the inner edge of the joint.

Second maxilla. Normal, a rather broad blade reduced to about half its diameter in the distal half. This portion forms a blade, the inner and distal margin of which is thickly covered with stiff setæ. The external joint is bifurcated, the inner part being the stouter, both terminate with four long setæ.

Maxilliped. A short basal joint, the masticatory lobe is two-jointed, subequal in length. The distal joint is rounded externally and armed at its extremity and internally with coarsely plumose setæ. The inner margin carries four papilliform teeth about the middle of its length. The palp is five-jointed, the first short, the

second the longest, this and the next are considerably expanded internally and provided with long setæ distally, the dorsal aspect carries a few short ones; the two terminal joints are cylindrical, rather slender and setose in the same manner as the second and third.

Pereiopoda. The first pair show a considerable sexual difference. In the male the limb is conspicuously clavate; the basis is long and slender, the ischium about half as long. The merus is shorter still, considerably expanded distally so as to become vase-shaped, with numerous fine setæ dorsally. The carpus is large and very stout, expanding distally and prolonged in its inner margin to an extent nearly equalling the length of the propodus; it is setose along its ventral margin, and distally where there are also two or three spines. The propodus is also a broad joint very much shorter than the carpus, it is expanded distally to form a sort of blunt spur ventrally, and this margin is covered with long slender setæ. The dactylus is articulated at the outer extremity of the propodus, is very stout and overlaps the carpal process by at least half its length, it terminates in a strong claw and a well-developed auxiliary; the ventral margin is fringed with long slender setæ. This limb is quite different in the female, the merus is but little expanded and does not differ otherwise from any ordinary joint; the carpus is a little longer, expanding distally with its ventral margin, forming a flattened blade which projects beyond the termination of the "shaft"; this blade is armed throughout with strong spines, longest and strongest distally; the propodus is stout, nearly as long as the two preceding joints together, with its inner margin rather swollen, and provided with three spines and several series of very fine stiff setæ, forming comb-like structures. The dactylus is long and slender, but does not reach the carpal process, it terminates in a long claw, with an auxiliary about one-third the size, the ventral margin of the joint is fringed with very small stiff setæ.

The remainder of these appendages differ but little in structure though a good deal in size; they are alike in both sexes and all are very slender. In the second appendage, the ischium is very little shorter than the basis, and carries a stiff seta; the merus is elongate, dilated dorsally, and also carries a stiff seta; the carpus is long, cylindrical, and provided with several setæ; the propodus is very much longer, armed along its ventral margin with spines; the dactylus is the shortest joint of the appendage armed with two claws and a seta between them. The three following pairs increase a little in length, but the posterior pair do so considerably. The basis is armed distally with a stout spur, the ischium is considerably longer; bent at a right angle, near its middle, the bend is distinctly shown in the structure of the joint, but it does not appear to be an articulation. All the other joints, except the dactylus, are lengthened, but their spinous armature is not strengthened.

The pleopoda, female. The first pair form a single opercular plate, which is broadly ovate and attached by a broad base; it is sparsely surrounded with short setæ, and the extremity is slightly irregular. The third pair is of more complex structure, the

endopodite has a rather broad peduncular joint, followed by a second nearly twice as long, its inner margin is nearly straight, its outer margin makes a bold curve outwards, sweeping round to the irregularly truncated extremity, which is armed with three large plumose setæ. The exopodite as a whole is falciform, it is composed of two joints, the basal one having an oblique extremity is very nearly as long as the entire endopodite; the second joint bears a conspicuous mid-rib, also seen distally on the other, and tapers gracefully to a point; a few small setæ occur externally.

The fourth pair has a small conical basal joint. The endopodite is long, curved and setose internally; it is composed of two joints, the distal one being about two-thirds the length of the other, it is armed distally with two blunt setæ or rather spines. The exopodite is scarcely as long as the endopodite, it is spoon-like, and the inner margin is sinuous, the outer boldly curved, then tapering to a blunt point. The remainder are similar, but the exopodite becomes more concave or spoon-like.

First pleopod of male. The sympodites are long narrow structures fused in the middle line. The external margins are curved inwards, dilating distally where they are deeply excavated and also appear to be tubular. This recess is occupied by a second joint, a thin ramus, the margin of which is ciliate. About three-fifths of the length of the sympodites there projects laterally an expansion from below.

The second pair is not quite so long, the inner edge of each is straight, the outer edge rounded, the structure being about four times as long as broad. The outer border is very finely ciliate and fringed with small setæ at intervals within the edge. This sympodite is marked with two strong muscle bands, the inner one bends abruptly inwards, connected with a stout irregular structure which passes forwards, projecting from the sympodite to bend again backwards as a large pointed blade. This is the exopodite. The other, the endopodite, forms a lobe rounded posteriorly, and has what appears to be a tubular mouth. The remainder are as in the female.

AUSTROMUNNA.

Austrimunna Richardson (**12**), p. 19.

This genus was instituted by Miss Richardson for a small Isopod found off Wiencke Island by the French Antarctic Expedition. The following is the second species assigned to the genus.

Austromunna rostrata.

(Plate X., fig. 3.)

Specific characters :—

Body ovoid.

Cephalosome small, with a short rounded rostrum, and with eyes on elongated peduncles.

Mesosome. Four anterior segments not widely separated from the three posterior, the three anterior segments with large truncated epimera.

Urosome broader than long with minute dorso-lateral uropoda.

The body is compact, ovoid in shape.

The cephalosome is of moderate size, exclusive of the eye-stalks. It is about one-third the greatest diameter of the mesosome; it is rounded anteriorly with a short stump-like rostrum in the middle line. The eye-stalks arise from the postero-lateral angles, but they can be hardly called slender, they extend to the margin of the epimera of the first segment of the mesosome. The eyes are not very strongly developed.

Of the mesosome the first four segments are separated by a distinct but short "waist" from the three posterior pair, this is more prominent in the female than in the male; the female also is proportionately broader.

The first segment is curved slightly to receive the cephalosome, and the broad truncated epimera are directed forwards, the three succeeding segments are subequal in length. The second has the anterior margin of its epimera extended forwards, on the third they are not so extended, and on the fourth they are smaller and rounded. The three posterior segments are much shorter, subequal in length and increase in curvature as they are reduced in diameter. Of these the epimera of the first are narrow and rounded, of the second they are enlarged and then form a blunt point, of the third they are more blade-like; the posterior margin is straight, the anterior being curved.

The metasome comprises one short narrow segment wedged in the curvature of the last of the mesosome and a urosome which is broader than it is long, rounded to the insertion of the uropoda, and to that point its margin is minutely dentate; beyond these it terminates in a blunt point.

The uropoda are very minute, dorso-lateral in position and comprise a small endopodite. The exopodite is extremely minute and can only be seen with difficulty. Both branches terminate with a few small setæ.

The body is entirely covered with very small setæ.

The first antenna consists of a two-jointed peduncle, the first joint being comparatively large and stout; the second is not more than half the length and much more slender. The flagellum is short, four joints only, of which the terminal one is the longest.

The second antenna has a peduncle of six joints, the first two are very small, the third is large, swollen externally; the fourth is very small and only forms a bend in the appendage; the fifth is smaller than the sixth, and the sixth is twice as small as the preceding. The flagellum is scarcely as long as the last two joints of the peduncle.

The mouth parts are normal.

The mandible has the cutting edge widely separated from the molar process, the latter is curved, tapering, and ends in three spinous teeth and four more slender spines below these; near the base of this process arises the three jointed palp. The cutting edge is an elongated process widening distally to a straight edge which bears one prominent tooth anteriorly.

The maxillæ hardly present any distinctive features.

The maxilliped is normal in character, it is short and thickened towards its straight inner border, and on this are two papilliform teeth; distally it carries a few spines. The palp is five-jointed, the first three progressively increase in length, the others decrease; the three distal bear rather long setæ internally.

The pereiopoda are not long, the first is short and stout, adapted as a prehensile organ. The basis is the longest joint, the ischium is about two-thirds its length and enlarged on its inner margin. The merus is half the length of the ischium and much enlarged dorsally and carries two setæ; the carpus is a large joint, slightly swollen ventrally and provided with spines and setæ; the propodus is shorter, stout and setose ventrally; the dactylus shorter still, with a strong accessory to the terminal claw and a curved seta near its extremity.

The remainder are distinctly ambulatory in function and are much more slender, every joint with the exception of the merus being approximately cylindrical; the merus is but slightly enlarged distally. There are but few small setæ scattered on these appendages, which slightly increase in size from the first pair to the last.

The first pair of pleopods act as an operculum to the remainder.

A number of specimens were taken from dredge material inside the 25-fathom line. A few individuals at a time were found during the whole of our stay.

ANTIAS.

Richardson (**12**), pp. 16–17.

This genus is another of those instituted by Miss Richardson for the Isopods brought back from the Antarctic by the French Expedition under Dr. Charcot. The species described below is identical with that found on the western side of Graham's Land and was abundant in our Winter Quarters.

Antias charcoti.

(Plate IX., fig. 1.)

Antias charcoti Richardson (**12**), pp. 17–19.

Specific characters :—

Cephalosome with a broad rostrum divided into two rounded setose lobes. A curved spur in front of ocular peduncle.

Both meso- and metasome fringed with long spinous setæ. A transverse row of fine setæ on four segments of the mesosome.

Uropoda large, biramous. Exopodite straight, endopodite curved.

The cephalosome is broad, but even including the ocular peduncles it is not quite so wide as the first segment of the mesosome. The anterior part is produced into two stout rounded tubercles, forming a broad and bifid rostrum, each part being well

provided with a number of stiff setæ. The eye-stalks are rather stout and in front of them; on the margin of the cephalosome is a stout slightly curved spur.

The surface of the cephalosome is sparingly covered with rather long setæ.

Of the mesosome the first segment is stout, the two following are subequal, but the third is the broadest, the fourth is a very little shorter and narrower than the preceding. All these have rounded epimera; they are rather widely separated and in the first segment they are directed forwards so as to partially embrace the cephalosome. All are provided with long spinous setæ, and the segments themselves are furnished with a transverse band of more delicate setæ.

The three posterior segments are curved posteriorly, their curvature increasing as their diameter decreases. The first of these segments carries a transverse row of setæ, the other two bear two or three stouter ones more laterally.

The metasome consists only of a single pentagonal plate, the angles of which are, however, rounded, and each of the three free ones bears a group of stout spinous seta similar to those on the epimera of the rest of the body. There are a few setæ on the surface of this plate, centrally and anteriorly.

The uropoda are very large and biramous. The protopodite is a single joint with a comparatively slender base and widening distally, the exo- and endopodite differ but little in size, the former is straight and provided on both sides with long stiff setæ; the latter is curved and only carries the setæ on the outer side of the curve and distally.

The first antenna is short, it comprises a peduncle of two joints subequal in length, but the proximal one is much shorter than the other, and fringed distally with stout spinous setæ. The flagellum is about half as long again as the peduncle and consists of only four joints, the first two are short, the others are more than twice as long, the last being very slender and provided with two specialised setæ.

The second antenna has a peduncle of five joints; of these the first three are very short and stout, the basal one having a long spine on its inner border and the third forms a characteristic bend in the appendage. The two terminal ones are long and slender, the advantage being with the more distal one; the flagellum is about as long as these two joints.

The mouth parts are normal.

The mandible is strong and the masticatory lobe terminates in four bilobed teeth, or, rather, two pairs, since one pair is larger than the other, the individuals of each pair being approximately subequal; below these are three slender teeth, having their upper margins produced into a serrated blade. The molar process is long and widens out distally into a plate-like structure, having anteriorly one prominent tooth and posteriorly several small tubercles. The palp is three-jointed, the first two joints are rather long, fringed on one side with very minute setæ; the third is a serrated spine less than half the length of the joint bearing it.

The first maxilla comprises a short and slender inner lobe armed distally with

four specialised setæ of varying length and bearing extremely delicate subsidiary setæ; the outer lobe, twice the size, is armed with several stout spinous setæ, each having a serrated inner margin.

The second maxilla consists of a comparatively large inner lobe, the inner margin of this is rounded distally and bears several slender spinose setæ, two of which, the innermost, are the longest and dentate; of the two outer lobes the innermost bears three slender, tapering and minutely serrated setæ, the other bears four.

The maxillipeds show a broad masticatory lobe upon a short basal joint of quite normal structure, the inner straight margin carries two papilliform teeth and distally there are a few dentate setæ; these are very minute. The palp is five-jointed, all the joints are slender and comparatively long. The epignath is long, rather spindle-shaped, most swollen on the outer side, and it terminates in a blunt point almost abreast of the distal border of the masticatory lobe.

The pereiopoda are short.

In the first the basis is a little longer than the ischium, both are slightly curved and quite smooth; the merus is short, expanded dorsally and carries a few stout setæ distally; the carpus is a little shorter with a stout spine ventrally; the propodus is rather longer with two such spines ventrally and a few delicate setæ distally; the propodus is stout with a strong claw and an equally strong though much shorter accessory with a fine seta between the two.

The second pereiopod differs in that the carpus is quite as stout as, but longer than, the merus; this latter bears one stout spine dorsally and a few fine setæ ventrally, the carpus bears several scattered setæ, strongest dorsally.

The third and fourth do not differ essentially; the fifth is rather longer, and the carpus bears four short and stout spinous setæ ventrally and three long ones dorsally, the two following are a little shorter and less conspicuously spinous. The brood pouch is formed by broad lamellæ on the second to the fourth appendages.

A large number of specimens of this species were taken during our stay in Winter Quarters; they were almost entirely picked out of the sponge débris.

Inside the 25-fathom line.

AUSTROSIGNUM.

Cephalosome sub-rotund, much narrower than the first segment of the mesosome.

Eyes small, on long slender peduncles.

Antennæ of moderate dimensions, peduncle of the second six-jointed, without an accessory appendage.

Mesosome, the three posterior segments distinctly separated from the four anterior, recurved and diminishing in size.

Metasome comprises a single independent segment and bulbous urosome often prolonged as a spinous process with minute preterminal uropoda.

Pereiopoda ambulatory except the first, which is prehensile.

Pleopoda, the first pair forms an operculum over the remainder.

This genus is a member of the family Munnidæ and probably more nearly related to *Pleurogonium* than to *Munna*.

Austrosignum grande.

(Plate X., fig. 1.)

Specific characters :—

Head small, rounded, with eyes on long slender stalks.

First segment of the mesosome much the longest, and all segments widely separated laterally ; a distinct waist between the fourth and fifth segments.

Urosome pointed.

The cephalosome is small, rounded in front ; it rests in a crescentic depression of the first segment of the mesosome which arches forwards on either side to receive it and is more than twice its diameter.

The eye scarcely appears to be well developed ; it lies at the extremity of a long, slender peduncle which arises from the postero-lateral angle of the cephalosome. The peduncles very nearly attain the width of the first segment of the mesosome.

The first segment of the mesosome is nearly twice as long as the succeeding one but of smaller diameter, the second to the fourth are subequal in length, but the third is the widest by the merest trifle. There is a distinct waist between the fourth and fifth segments ; the three posterior ones are subequal in length, decreasing progressively in width and increasing in curvature. The epimera are rounded, in the first segment unevenly so, and all are widely separated from each other, elongated, and not distinct from their respective segments.

The metasome comprises one very small segment wedged in the curvature of the preceding one, and a urosome which is ovoid in shape but having a slightly truncated extremity.

The uropoda are very small ; they are situated at some little distance from the extremity, and comprise a comparatively stout pointed joint or propodite, and articulated to it at about half their own length from the extremity are two minute joints.

The first antenna comprises a two-jointed peduncle, both joints are comparatively long, the second being the longer ; the flagellum is about as long as the peduncle.

The second antenna comprises a six-jointed peduncle, the first two joints of which are short and stout ; the third is very nearly twice as long and more slender ; the fourth is shorter than the preceding, curved to form the bend in the appendage, the other two are slender and as 2 to 2·5 in length ; a few setæ are scattered throughout the peduncle. The flagellum is scarcely as long as the last joint of the peduncle.

The mouth parts are normal.

The mandible is stout, the cutting edge is prominent, expanding to its distal extremity which bears a very small tooth both anteriorly and posteriorly, the intermediate margin being minutely toothed. The molar process is stout, curved and tapering, it ends in two or three stout teeth and four slender spines below these.

The palp was not observed.

The first maxilla consists of the normal two lobes, the inner and smaller carries distally two large and one small seta, which are slightly plumose, the outer lobe is armed with stout spines.

The second maxilla. The principal lobe is nearly as broad as the other two together and is armed with stout pectinate spines, the innermost ones being the shortest and strongest. The other lobes are subequal in size, and each bears two long pectinate spines, which are much more delicate than those on the inner lobe.

The maxillipeds are of quite normal proportions; the distal margin of the masticatory lobe is armed with three or four denticulate spines. There are two papilliform teeth on the inner margin, these are rounded knobs with short stalks. The palp is five-jointed, the first three are broad and progressively increase in length, the remaining two become more finger-like.

The pereiopoda are, except the first, uniform in structure, slender and not inordinately long, as far as can be seen without removing a limb. The first pereiopod is rather short and much stouter than the others, obviously prehensile in function. The basis is stout and of moderate length, the ischium rather more than half as long. The merus and carpus are both very short and stout, the latter is much dilated, with two stout spines ventrally. The propodus is slightly curved and about as long as the two preceding joints. The dactylus is well developed, with a spine or accessory claw at the base of the nail and two curved setæ upon it.

Of the others the basis is rather long, the ischium much shorter. The merus is short and enlarged dorsally; the carpus is quite twice as long; the propodus a little longer and much more slender than the carpus; the dactylus is well developed, proportionally one-third the length of the propodus, and a "nail" is distinct with a small spine or spinous seta at its base.

The first pair of pleopoda which forms an operculum over the remainder consists of a comparatively narrow band which at about two-thirds of its length widens out considerably and then tapers to a blunt point. The lateral projection bears three small setæ, and the angular apex is due to the folding of the lateral margins inwards and downwards.

Four specimens were taken in Winter Quarters during February and March, 1902, before the ship froze in. Inside the 20-fathom line.

Austrosignum glaciale.

(Plate X., fig. 2.)

Specific characters :—

Head small, rounded ; eyes not well developed, at the extremity of slender peduncles.

First four segments of the mesosome subequal in length, and separated from the posterior three by a distinct " waist " ; the posterior three diminishing in diameter, and but slightly curved.

Urosome a pointed oval, rather elongate, with minute preterminal uropoda.

The cephalosome is small, resting in a shallow crescentic depression of the first segment of the mesosome, which has nearly twice its diameter. Near the postero-lateral margins arise long slender stalks which bear small, apparently simple eyes. These stalks are unjointed prolongations of the cephalosome, and in length they are nearly half its diameter.

Of the mesosome the third segment is the largest and widest ; between the epimera of the fourth and fifth there is a distinct space, and the last three progressively diminish in diameter and increase in curvature, but not to any great extent. The epimera of all are rounded.

The metasome comprises a small joint and a urosome, which may be described as ovoid but attached by a short and broad peduncle.

The uropoda are very small, biramous ; the basal joint is extremely short, and each branch consists of two minute joints ; the endopodite is the most slender and is no more than a very small joint and spine.

A few setæ are scattered about the margin of both mesosome and metasome.

The first antenna is short, comprising a peduncle of two rather elongated joints, the second being the larger. The flagellum is about as long as the peduncle.

The second antenna has a peduncle of six joints, the first two are short and stout ; the third is about as long but more slender ; the fourth very short, only forming a bend in the appendage ; the fifth is rather long, and the sixth longer still ; the flagellum is short, but little longer than the last joint of the peduncle.

The mouth parts are quite normal in structure. The mandible consists of a stout process with a small but strong tooth at its anterior border ; the molar process is long and slender and armed with five teeth, of which one, the second, is larger than the rest ; there are also several stout setose spines just behind this terminal group. The palp is long, three-jointed.

The first and second pair of maxillæ do not present any special features unless it be that some of the terminal spines on the outer part of the outer lobe are really strong teeth ; the lobes of the second pair are finely serrated.

The maxilliped is of normal appearance ; the straight distal edge of the masticatory lobe bears some half-dozen stout setæ, which are finely serrated. Two

papilliform teeth occur on the inner margin. The palp is five-jointed ; four joints are short and broad ; the terminal one is also short, and, though much more slender, it is more correctly described as a stump. The three central joints are each provided on the inner border with two or three long setæ, and the third of the entire series is the largest.

The pereiopoda, except the first, are uniform in structure. The first is short and comparatively stout ; the basis is long ; the ischium little more than one-third the length ; the merus is quite short and expanded distally ; the carpus is a little longer, much expanded ventrally to form a round "cutting" edge which carries two stout spines. The propodus is a little longer still and similarly expanded ventrally, but not quite throughout the entire length of the joint ; the dactylus is about as long, slender, and bears a slender claw distinct from the joint and a much smaller though distinct accessory. A few setæ are scattered throughout the appendage.

The other appendages are slender, but not so long as the body. The basis is little longer than the ischium ; the merus is short and swollen dorsally. The other joints are comparatively long and become increasingly slender ; the propodus is a little longer than the carpus, and each of these have two spinous setæ ventrally. The dactylus is slender, slightly curved, rather more than half as long as the propodus.

The pleopoda are protected by a sort of hood formed by the urosome, and the first pair forms a shield to the rest. The ovigerous female is much broader than the male.

Four specimens were taken in Winter Quarters inside the 20-fathom line in February, 1902.

NOTOPAIS.

Cephalosome broad and short, excavated in front and without eyes.

Mesosome with the three posterior segments recurved, tapering and separated from the four anterior ones.

Cephalosome and anterior segments of the mesosome spinose.

Metasome a single plate with minute terminal uropoda.

Pereiopoda, anterior ones ambulatory, posterior ones defective, very slender and not disproportionally long.

Pleopoda, first pair opercular.

The Munnopsidæ (*Ilyarachna*), to which this genus should be assigned, are notorious for the natatory character of the posterior pereiopoda. A deficiency in this respect of this appendage is, therefore, serious. The genus *Ilyarachna* seems to be its nearest relation.

Notopais spicatus.

(Plate VIII., fig. 1.)

Specific characters :—

Cephalosome armed dorsally, with two stout spines and two lateral ones.

Mesosome with the five anterior segments armed with four strong forwardly directed spines, the first four segments having others laterally.

Urosome triangular, truncated, with minute terminal uropoda.

The cephalosome is wide, nearly as wide as any other part of the body. Its anterior margin appears to be rounded, but close examination shows that it is deeply excavated, and the first pair of antennæ arise near the anterior border of this excavation. Not far from the rounded lateral margins of the cephalon is a small but distinct spine, and there are two more prominent dorsally, but more distant from the middle line than on succeeding segments.

The impression one receives in examining this animal is that the cephalon and first segment of the thorax are distinct, the latter being much smaller than, and above the former, a condition which occurs in the genera *Ilyarachna* and *Pseudarachna* of Prof. G. O. Sars.

Of the mesosome the first two segments are subequal, and the two following ones are also subequal but a little longer, their anterior margins are provided with four stout and prominent spines directed forwards, these are placed at approximately equal distances apart, the median pair being the largest. The epimera are rather elongated, not separable from the body, but where they might be said to arise is a small, blunt spine ; the epimeron itself is in each case rounded, and about the middle of its margin is another spine not so large as the dorsal ones ; an additional one arises at their anterior margins in the first, second, and fourth of these segments. The three posterior segments are separated from the preceding by a distinct waist. These segments are curved backwards ; the first two are subequal, the third is about half the size ; the anterior margin of the first bears four large spines similar to those on the preceding segments.

The metasome comprises a single plate, the urosome, which is a truncated triangle, its margins sloping from the mid-dorsal line. It is covered with fine setæ more thickly than the rest of the body, where they are rather sparingly distributed. The uropoda are minute, terminal, and arise ventrally. Each consists of a very small exopodite, a rather barrel-shaped and diminutive endopodite of about half the size, both terminating in a few setæ.

The first antennæ arise quite close to the middle line just below the upper margin of the cephalon ; the first joint of the peduncle is very large comparatively and bears two teeth on its inner distal margin ; it terminates as a cone, and on the upper surface of this are one or two short joints, I cannot be certain which it is ; the flagellum is very slender and consists of a long joint, a very short joint and a long portion in which the articulations under existing conditions are indistinguishable.

Of the second antennæ only small portions remain. These arise close to the external border of the cephalon, and only four joints of the peduncles exist; the first three are very short and stout, armed externally with a stout spine; the third has a very oblique distal margin and is provided internally with several strong setæ; the fourth joint is also very small and much more slender than the others.

The animal has not been dissected at all, and from what can be seen of the maxillipeds *in situ* they are of the usual type and have a comparatively very large epignath, broad and ending in a blunt point. The palp is five-jointed, the first joint is short and broad; the second nearly three times as long; the third half as long as the preceding but narrower, the two terminals are subequal in length, rather short and setose.

The pereiopoda may be described as rather long, but not disproportionately so, and very slender; most of them have been more or less severely injured. The first pair are complete and are ambulatory; they exhibit a long slender basis, an ischium rather more than half the length, a short and dorsally-expanded merus, a carpus as long as the ischium, a propodus almost equally long, and a dactylus one-third the length. Ventrally the carpus and propodus bear scattered setæ. I have not been able to distinguish any accessory claw. The other pereiopoda are very similar as far as can be made out, but the proportions of the joints are rather different, and there is no accessory claw. They are too fragmentary to permit of a definite statement as to the adaptation of the posterior ones for swimming as is characteristic of the *Munnopsidæ*.

The first pleopoda are strongly developed as an operculum to the remainder, and the inner border of that of the right side is armed with four or five stout teeth.

Only a single specimen of this species was extracted from the dredge material shortly after arrival at Winter Quarters. Inside the 20-fathom line, February 28, 1902.

I have to express my sincere thanks to Messrs. West, Newman & Co. for the trouble and care they have taken in the preparation of the plates, also to Mr. F. S. Murray for other assistance.

The day after sending in the corrected proof of this Report I received from Miss Richardson a Supplementary Report on the Isopoda collected by the French Antarctic Expedition. She there records the following species :—

Nototanais antarcticus Hodgson.
„ *australis.*
Gnathia antarctica Studer.
Exosphæroma antarctica.
Cymodocella tubicauda Pfeffer.
Serolis polita Pfeffer.
Notasellus australis Hodgson.
Haliacris australis Hodgson.
Antias charcoti Richardson.
Austrimunna antarctica Richardson.
„ *serrata.*
„ *subtriangulata.*
Austrimunna incisa.

The individuals forming this collection are rather scanty in number and the majority have apparently been more or less severely injured. Of the five new species not more than four representatives were found for any of them. *Nototanais australis* is very closely allied to *N. antarcticus*, but differs in the structure of the first appendages of the mesosome of the male. Except for this difference the resemblance is exceedingly close.

Cymodocella tubicauda.—I have dealt at length with this species.

Haliacris australis.—I think I have satisfactorily proved that this species is identical with *H. antarctica* Pfeffer, and it should be included under that name.

Austromunna serrata.—This species does not appear to be assigned to the right genus; it closely resembles my *Austronamus*, but is distinct from the species I have described.

Austromunna subtriangulata.—This comes very close to, if it is not identical with, my *Austromunna rostrata.* Only a single specimen was found and no reference is made to its legs; these might easily have been injured.

Austromunna incisa.—This species is a very close relation to my new genus *Austrosignum*, to which, I think, it should be assigned. It seems most closely allied to *A. grande.* Here again there is no information as to the legs, beyond an outline figure of the first appendage of the mesosome.

The figures which accompany the Report do not impress me greatly, but if they are to be relied on the species are not to be identified with those taken by the 'Discovery.' In the last two species, however, I very much doubt this.

REFERENCES.

1. Beddard, F. E.—Report on the Isopoda collected by H.M.S. 'Challenger' during the years 1873–76. Part i. The Genus Serolis, vol. xi. (1884). Part ii. Isopoda, vol. xvii. (1886). H.M.S. 'Challenger' Reports.

2. Chilton, C.—Notes on some New Zealand Amphipoda and Isopoda. Trans. N. Z. Inst., xxiv. (1892), pp. 258–69.

3. Chilton, C.—A new species of Munna from New Zealand. Ann. and Mag., Nat. Hist., ix. (1892), pp. 1–12. Two plates.

4. Cunningham, R. O.—Notes on the Reptiles, Amphibia, Fishes, Mollusca and Crustacea obtained during the voyage of H.M.S. 'Nassau' in the years 1866–69. Trans. Linn. Soc. London, vol. xxvii. (1871), pp. 465–501.

5. Dollfus, A.—Crustacés Isopodes. Mission Scient. du Cap Horn, vol. vi. Zoologie, part ii., pp. F 55–76. One plate.

6. Eights, J.—Description of a new Crustaceous Animal found on the shores of the South Shetland Islands. Trans. Albany Inst., vol. ii. (1833), pp. 53–57. Two plates.

6a. Hansen, H. J.—Cirolanidae et familiae nonnullae propinquae Musei Hauniensis. Kgl. Danske Videns. Selsk. Skr., 6 Række, Math. Nat. Afd. V. 3 (1890), pp. 239–426. Ten plates.

7. Hansen, H. J.—On the Propagation, Structure and Classification of the Family Sphaeromidae. Quar. Jour. Micr. Sci., xlix. (1905), pp. 69–135.

8. Hodgson, T. V.—Crustacea. Report on the Collections of Natural History made in the Antarctic Regions during the voyage of the 'Southern Cross' (1902), pp. 228–61. Plates XXIX.–XL.

9. Hutton, F. W.—Index Faunae Novae Zealandiae, Isopoda, pp. 262–66, London (1904).

10. Ohlin, Axel.—Isopoda from Tierra del Fuego and Patagonia. 1. Valvifera. Svenska Exped. till Magellanslanderna II. (1901), pp. 261–306. Plates XX.–XXV.

11. Pfeffer, G.—Die Krebse von Sud-Georgien, part i. Jahrb. d. Hamburgischen wiss. Anstalt, Bd. V., pp. 43–150. Plates I.–VII.

12. Richardson, Harriet.—Isopodes. Expédition Antarctique Française, 1903–5 (1907).

13. Sars, G. O.—Isopoda. Crustacea of Norway, vol. ii. (1899).

14. Schiödte, J. C., and Meinert, F.—Symbolae ad Monographiam Cymothoarum; Crustaceorum Isopodum Familia. Naturhistorisk Tidsskrift, Vol. XII. (1879), pp. 321–414. Plates 7–13.

15. Stebbing, T. R. R.—A History of Crustacea. Internat. Sci. Series (1893), pp. 314–435.

16. Strassen, O. zur.—Ueber die Gattung Arcturus und die Arcturiden der Deutschen Tiefsee-Expedition. Zool. Anz., Bd. XXV. (1902), pp. 682–89.

17. Studer, T.—Ueber neue Seethiere aus dem Antarktischen Meere. Mitth. Naturf. Gesellsch. Bern (1876), pp. 75.

18. Studer, T.—Isopoden gesammelt während der Reise S.M.S. 'Gazelle' um die Erde 1874–76. Anh. Abhandl. der Akad. wiss. Berlin, 1883 (1884), 28 pp.

19. Studer, T.—Beiträge zur Kenntniss niederer Thiere von Kerguelensland. Die Arten der Gattung Serolis von Kerguelensland. Arch. f. Naturgesch. XLV. Bd. 1 (1879), pp. 19–34. One plate.

EXPLANATION OF THE PLATES.

PLATE I.

1. *Leptanthura glacialis*, ♀, × 6.
   - *a*. First antenna × 40.
   - *b*. Second antenna × 40.
   - *c*. Maxilla × 40.
   - *d*. Maxilliped × 40.
   - *e*. First appendage of mesosome × 40.
   - *f*. Second appendage of mesosome × 40.
   - *g*. Last appendage of the mesosome × 40.
2. *Gnathia antarctica*, ♂, × 14.
3. *Euneognathia gigas*, ♂, × 6.
   - *a*. Maxilliped × 15.
   - *b*. First appendage of mesosome × 15.

PLATE II.

1. *Ægа antarctica** × 3.
   2. Maxilla × 20.
   3. Maxilliped × 20.
   4. First appendage of mesosome × 16.
   5. Sixth appendage of mesosome × 16.

PLATE III.

1. *Cirolana meridionalis*, ♀, × 2.
   2. First maxilla × 20.
   3. Second maxilla × 20.
   4. Maxilliped × 20.
   5. First appendage of mesosome × 7.
   6. Sixth appendage of mesosome × 7.

PLATE IV.

1. *Serolis trilobitoides*, ♂, × 1, dorsal aspect.
   2. The same, ventral aspect.
   3. Specialised seta from mandibular palp, terminal joint × 312.
   4. First maxilla × 20.
   5. Second maxilla × 20.
   6. Maxilliped × 20.
   7. Sensory spine from propodus of second thoracic appendage × 312.
   8. Sensory lamella from propodus of second thoracic appendage × 312.

PLATE V.

Antarcturus.

1. *A. adareanus*, ♀, × 3.
2. *A. franklini*, ♀, × 3.
3. *A. australis*, ♂, × 3. (This is the male of *A. franklini*.)

* Not *Ae. australis*, as on the plate.

PLATE VI.

Antarcturus.

1. *A. hiemalis*, ♂, × 3.
   1*a*. First antenna × 20.
   b. First maxilla × 20.
   c. Second maxilla × 20.
   d. Maxilliped × 20.
   e. First appendage of mesosome × 12.
2. *A. meridionalis*, ♂, × 3.

PLATE VII.

1. *Glyptonotus acutus*, ♂, × 1.
   2. First maxilla × 6.
   3. Second maxilla × 6.
   4. Maxilliped × 6.
   5. First appendage of mesosome × 2.

PLATE VIII.

1. *Notopais spicatus*, ♂, × 27.
2. *Austrofilius furcatus*, ♂, × 30.
   2*a*. Mandible × 200.
   b. First maxilla × 200.
   c. Second maxilla × 200.
   d. Maxilliped × 150.
3. *Austronanus glacialis*, ♂, × 70.

PLATE IX.

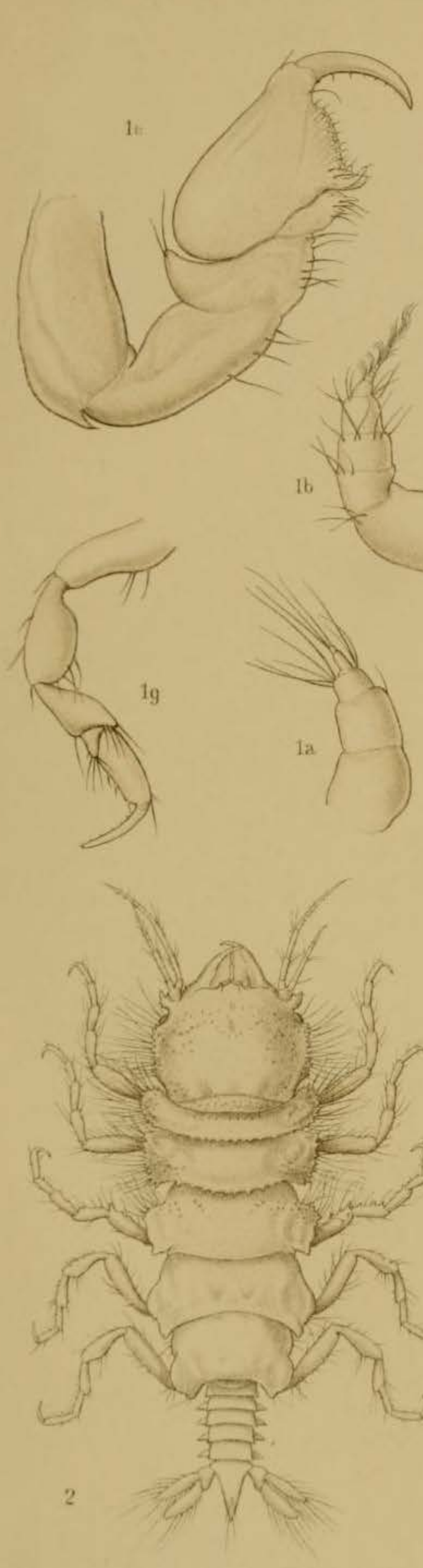
1. *Antias charcoti* × 27.
2. *Coulmannia australis*, ♂, × 20.
   2*a*. Maxilliped × 104.
3. *Notoxenus spinifer*, ♂, × 27.
   2*a*. Maxilliped × 200.

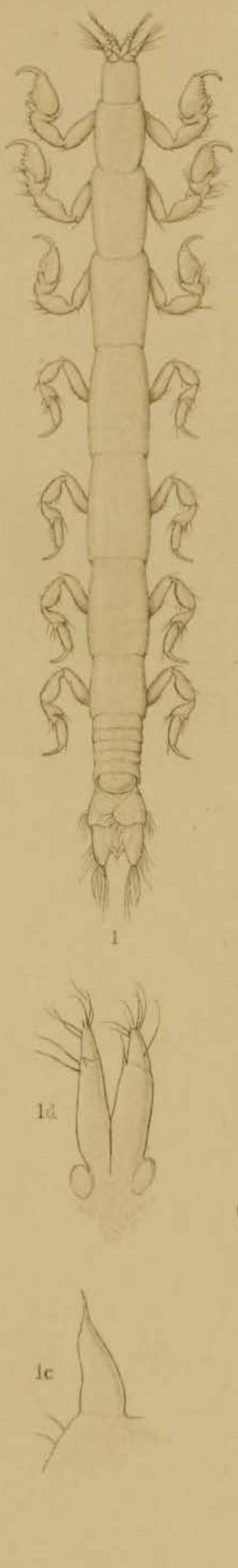
PLATE X.

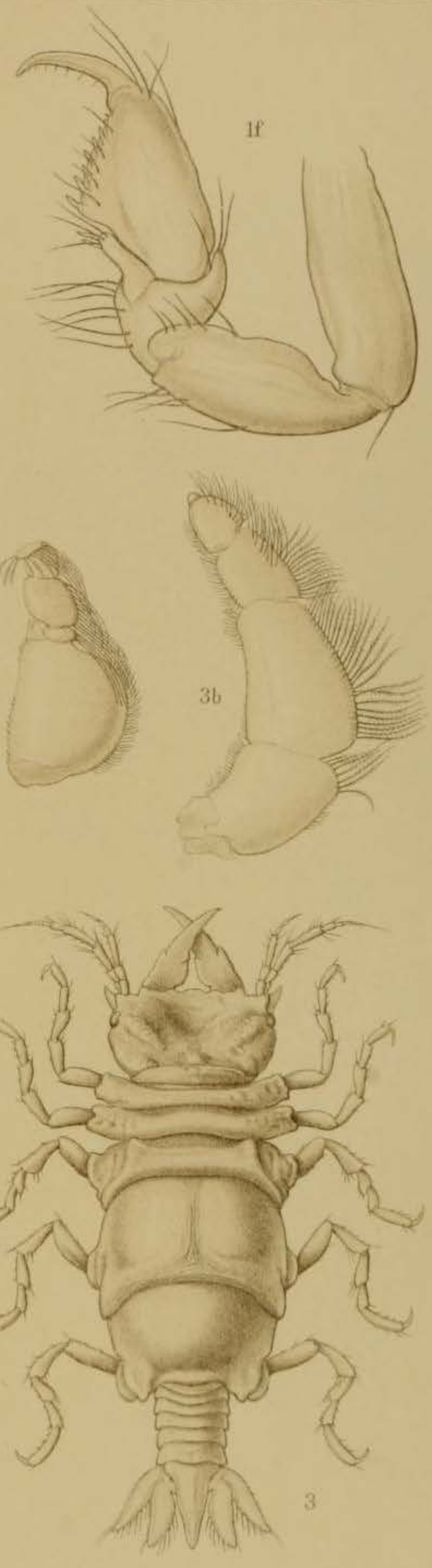
1. *Austrosignum grande* ♂, × 27.
2. *Austrosignum glaciale*, ♂, × 27.
3. *Austromunna rostrata*, ♂, × 27.

INDEX.

Species described are marked with *. Synonyms in *italics*.







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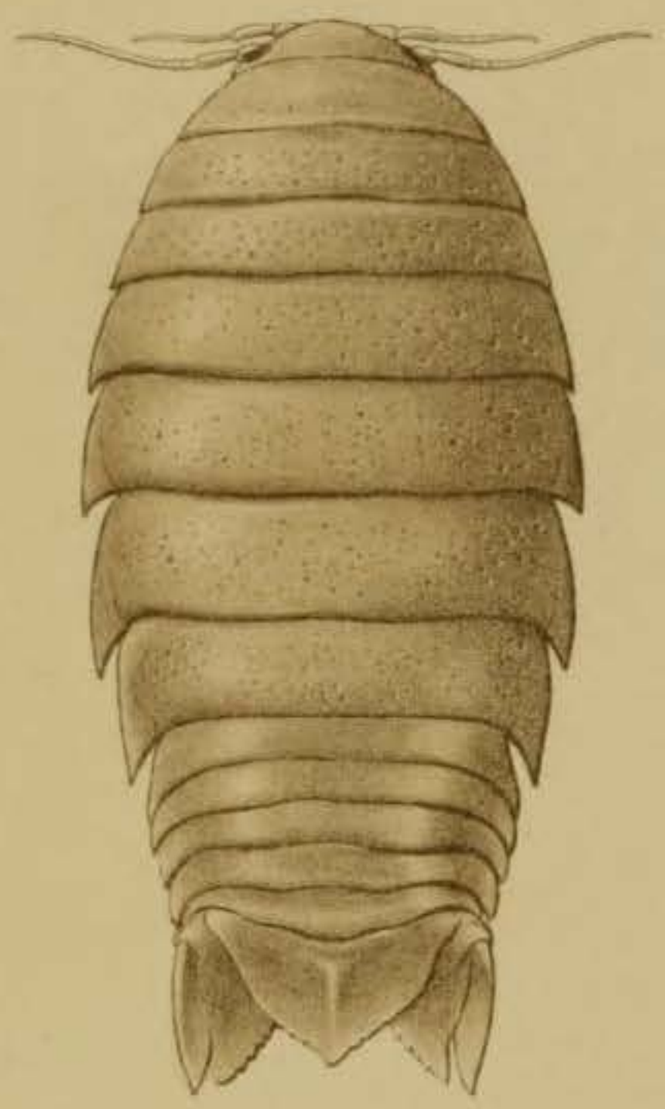

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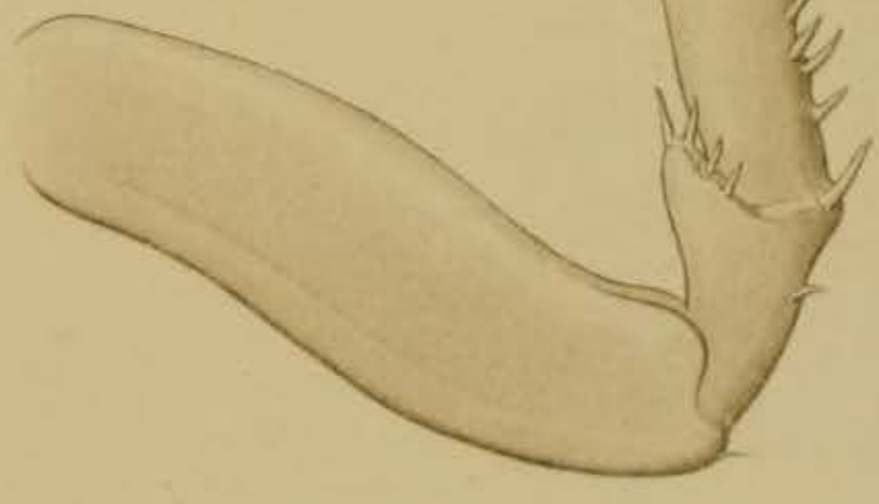

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West, Newman del et lith.

Ægα australis.

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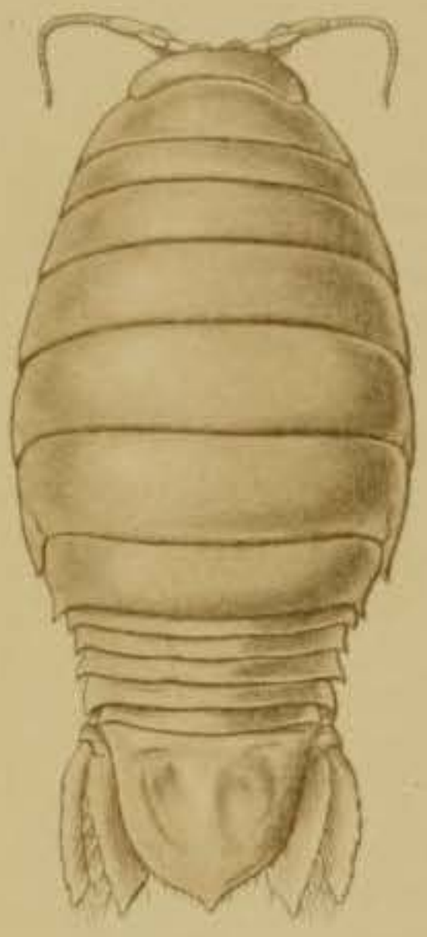

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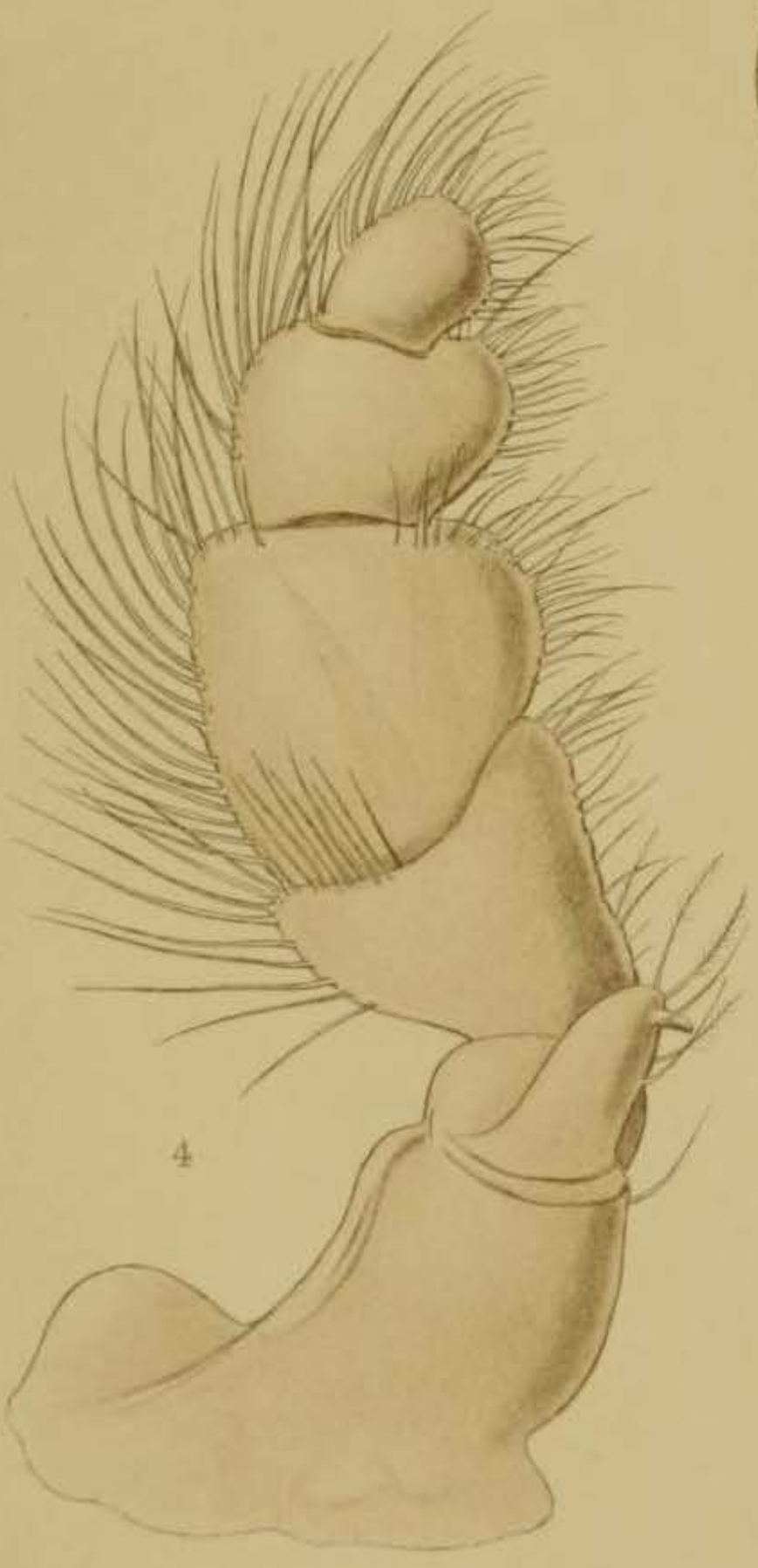

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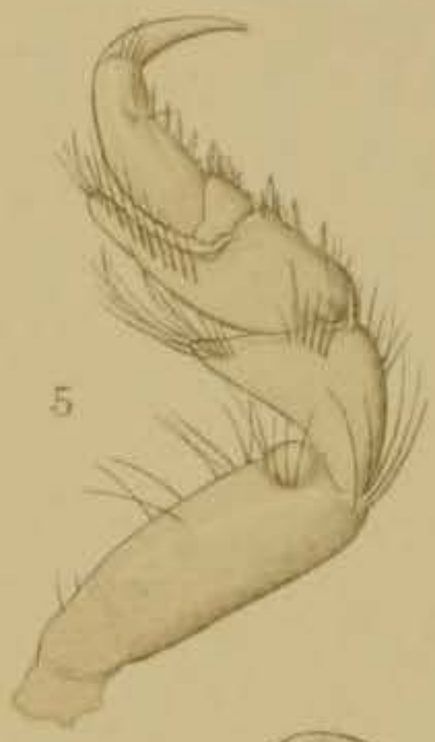

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Cirolana meridionalis

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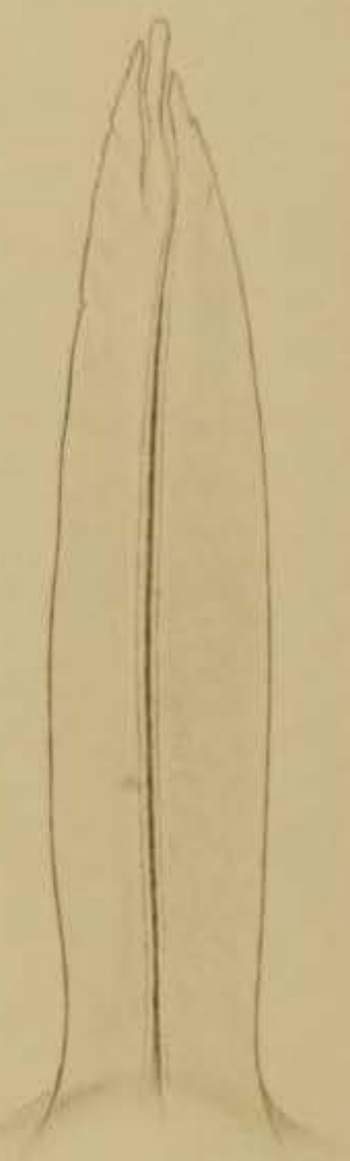

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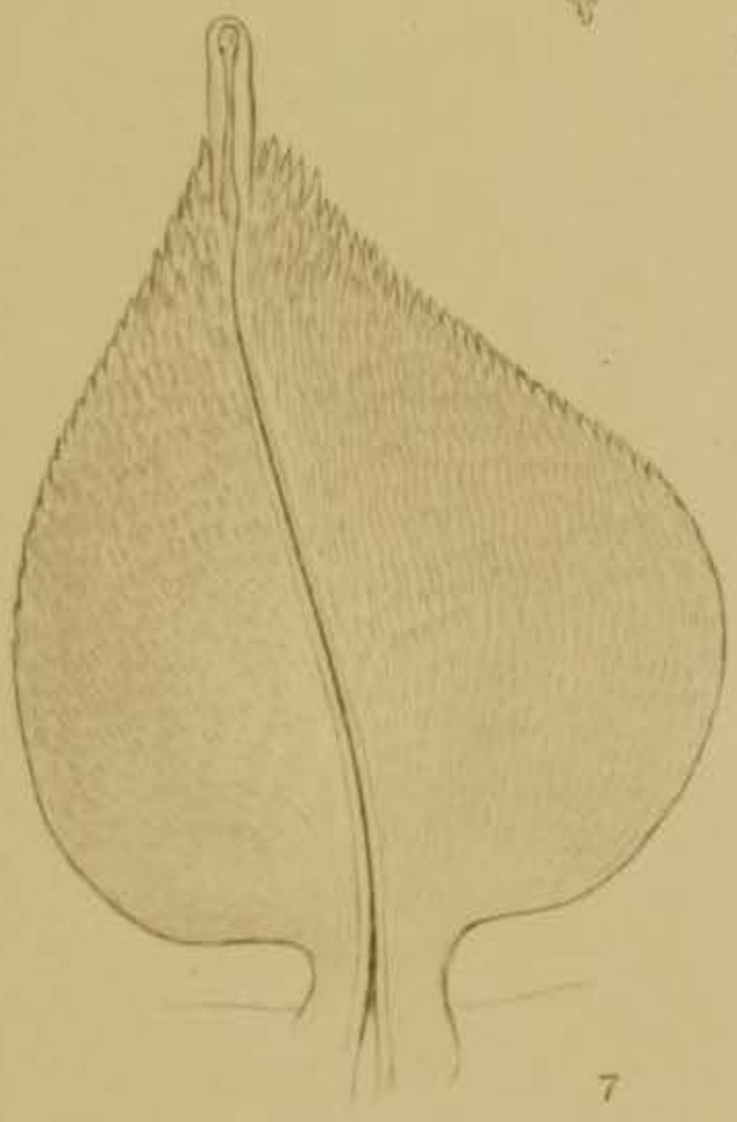

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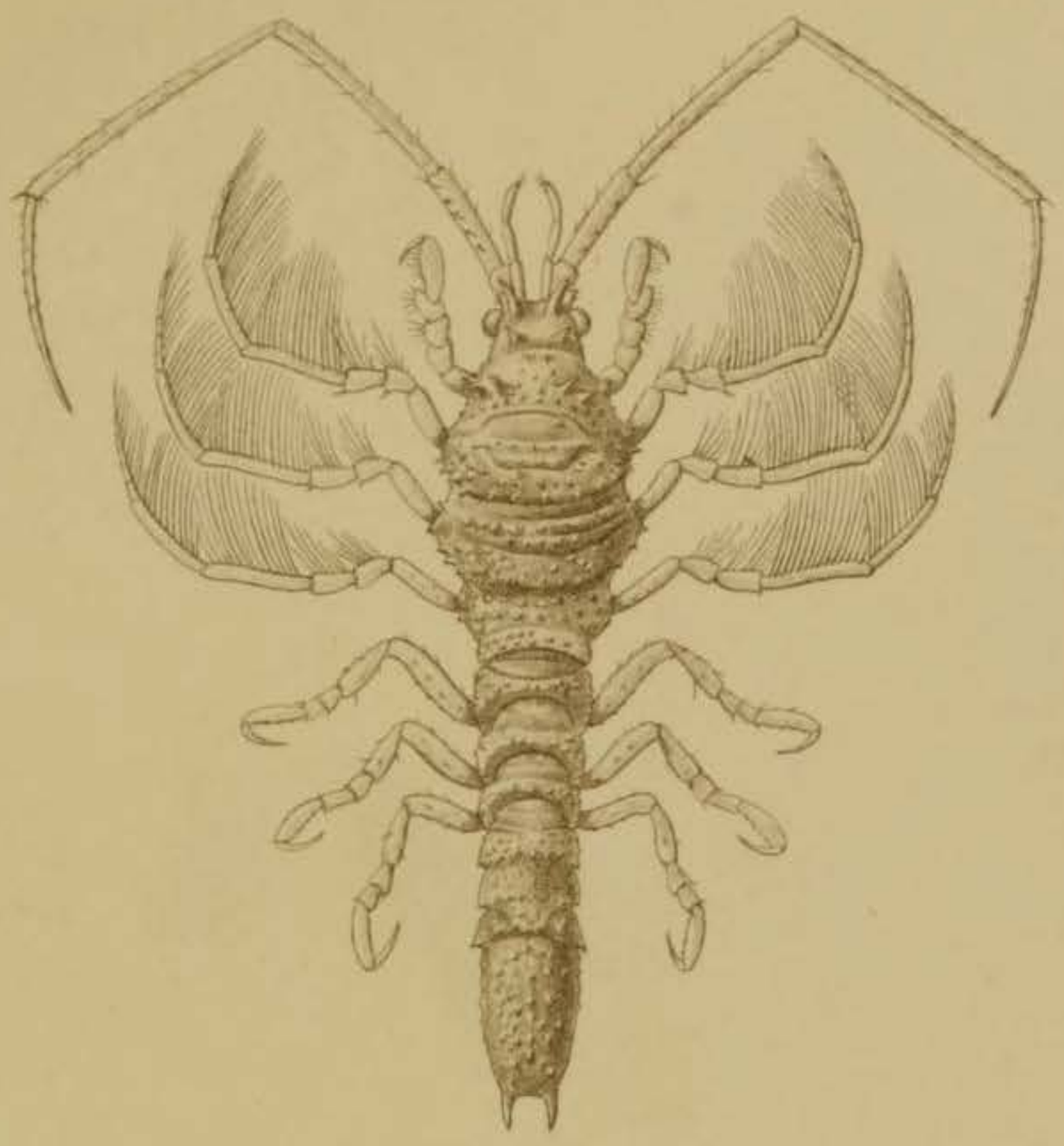

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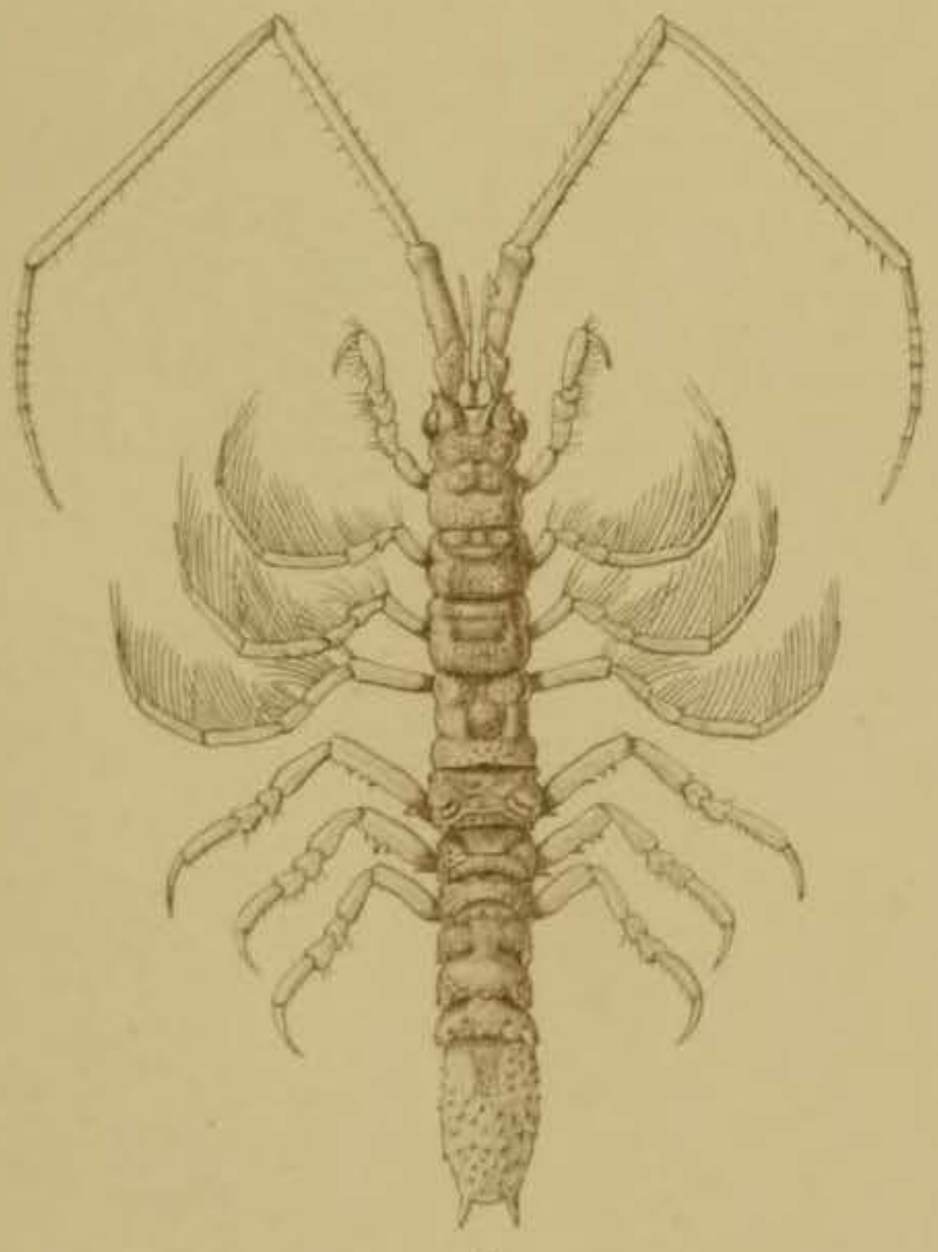

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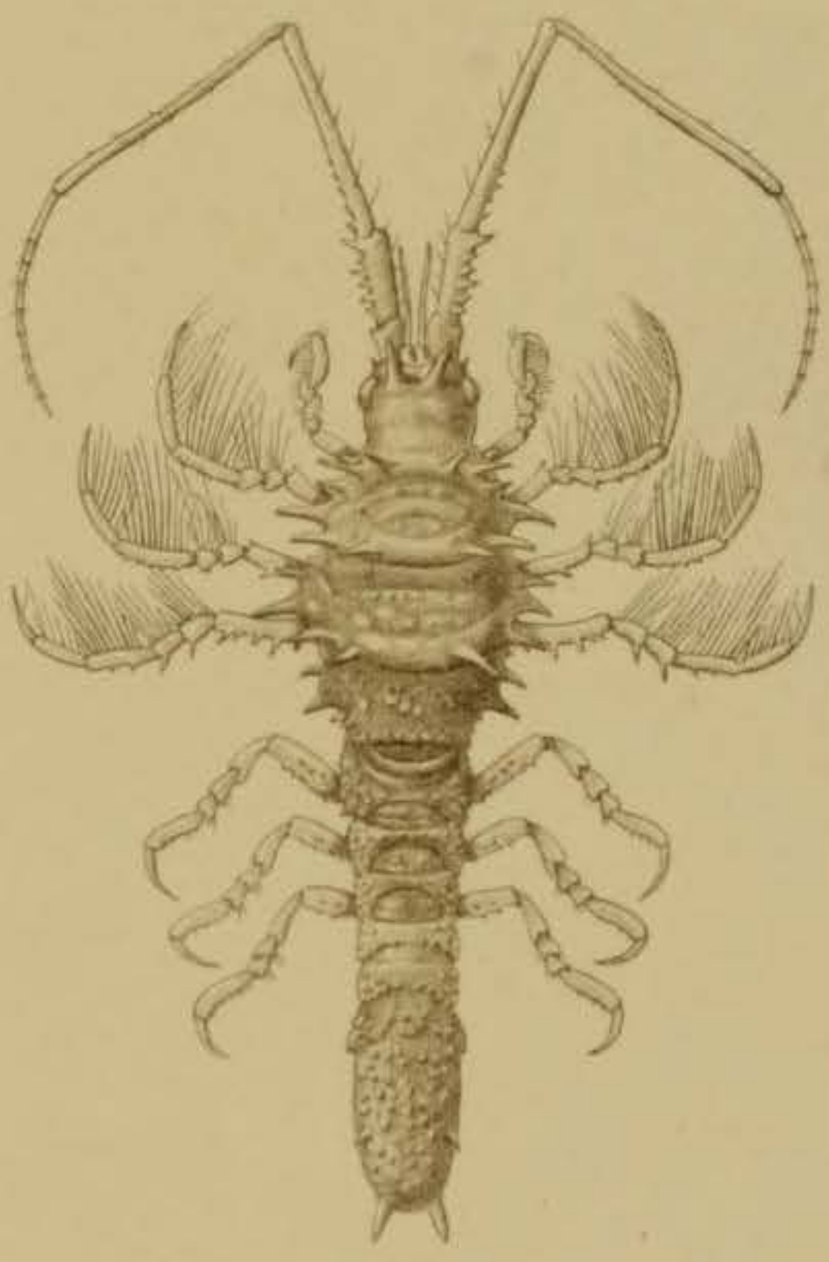

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Antarcturus.
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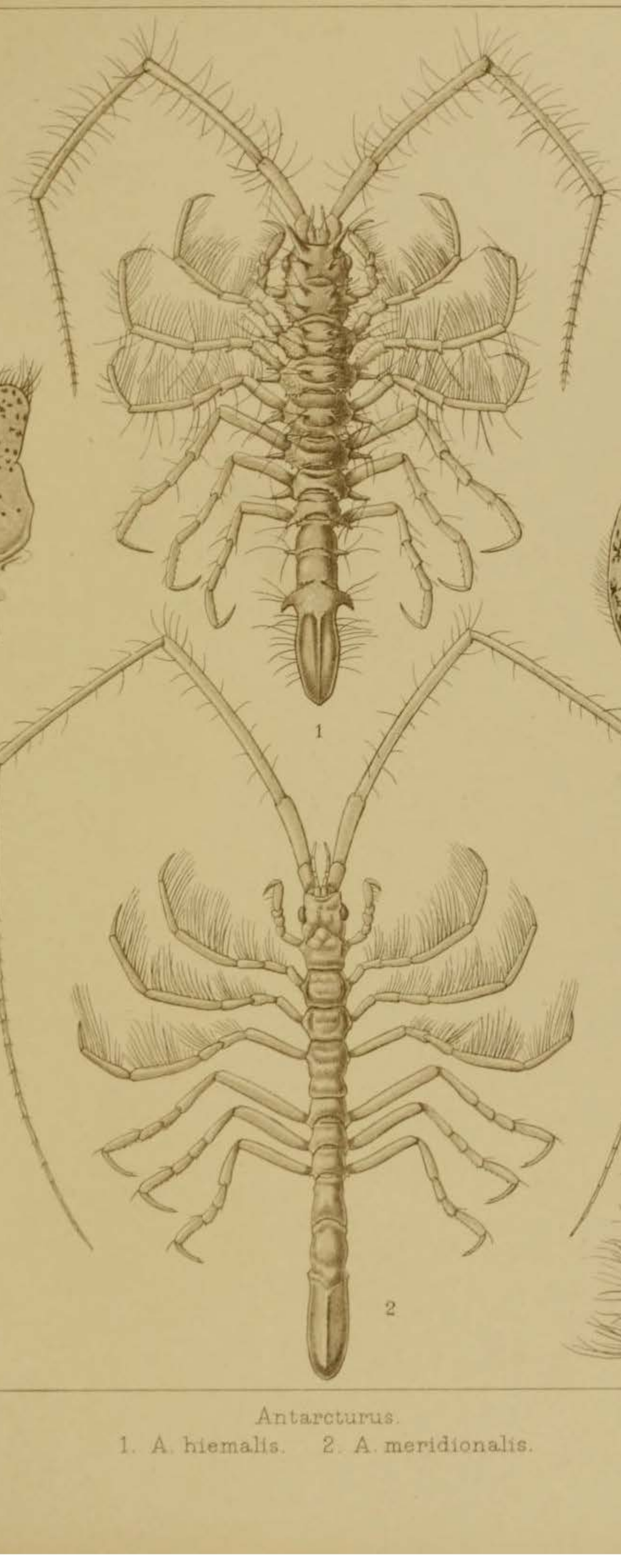

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West, Newman del.et lith.

Antarcturus.
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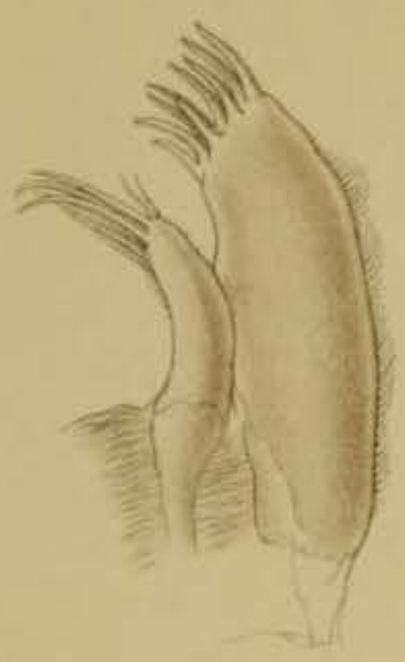

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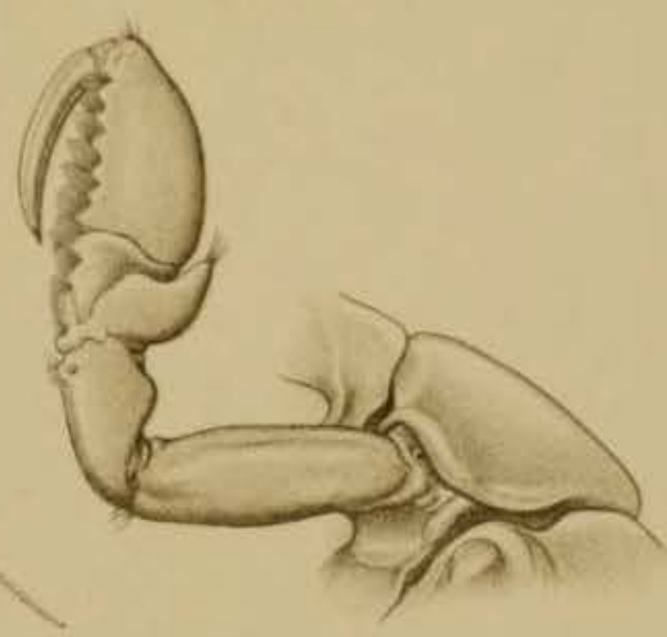

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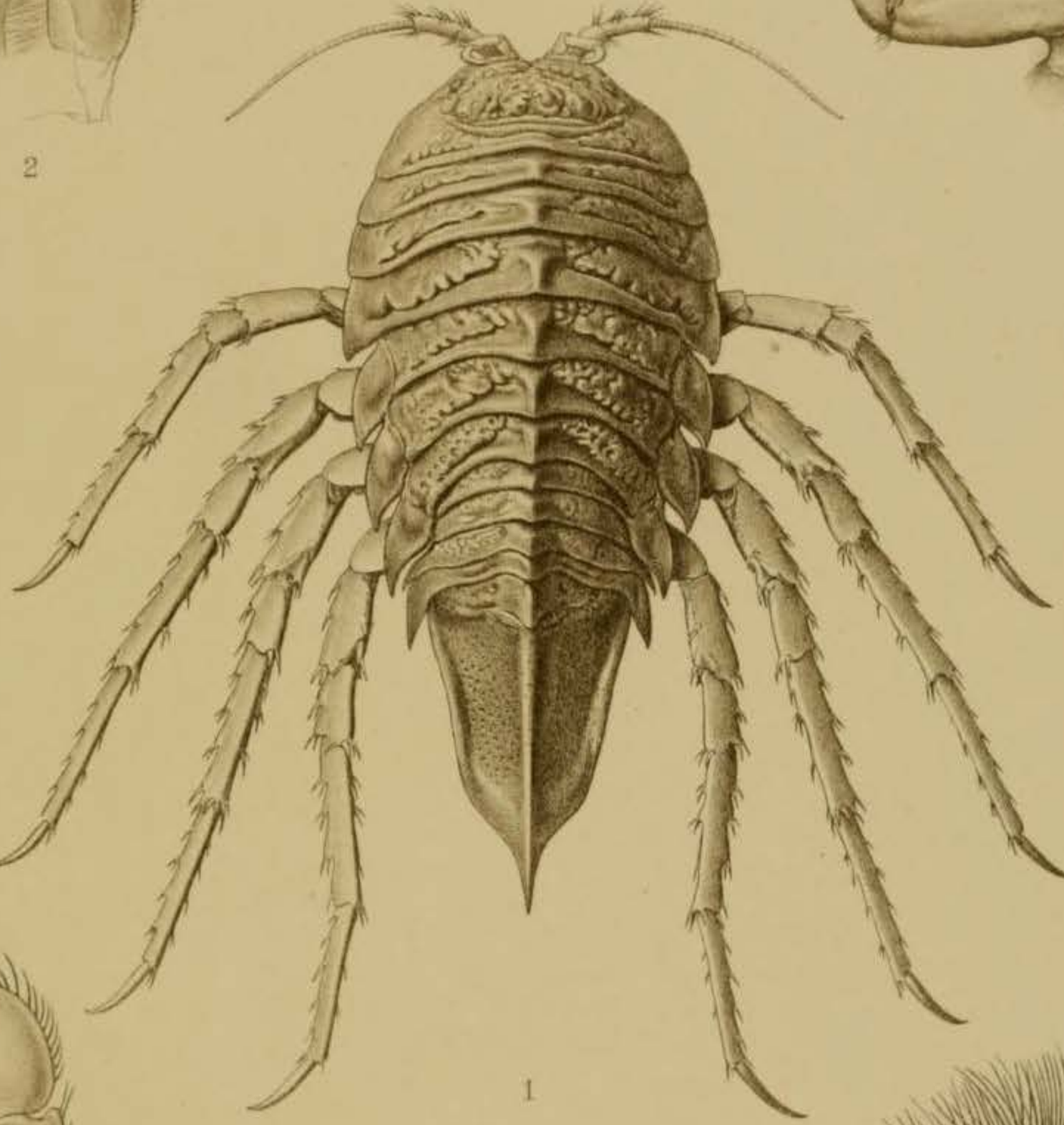

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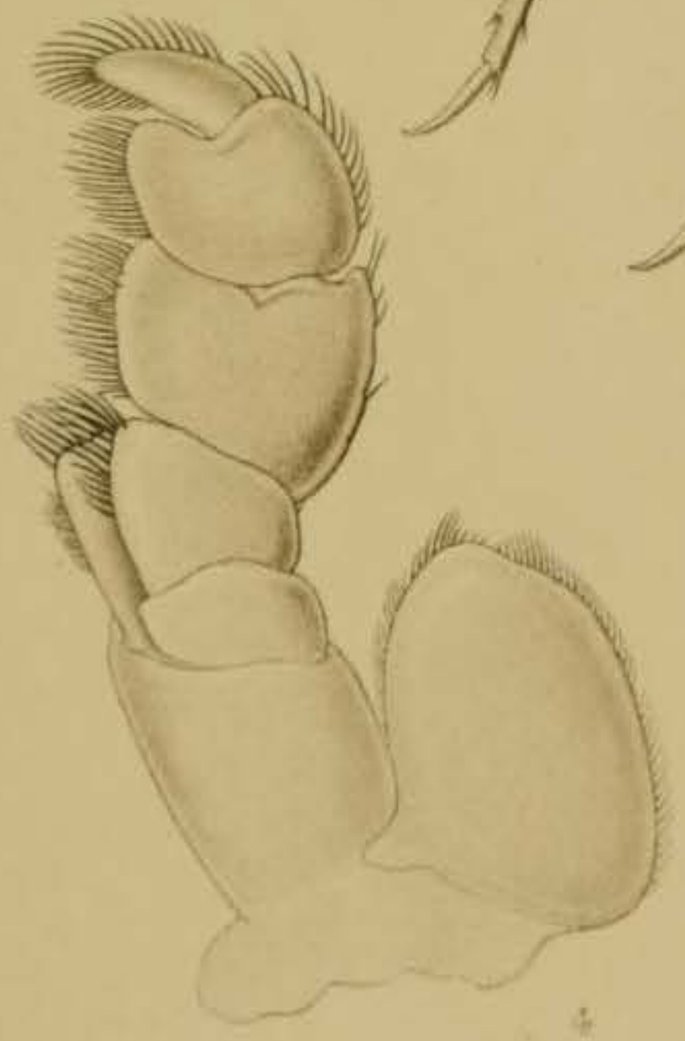

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West, Newman del et lith

Glyptonotus acutus

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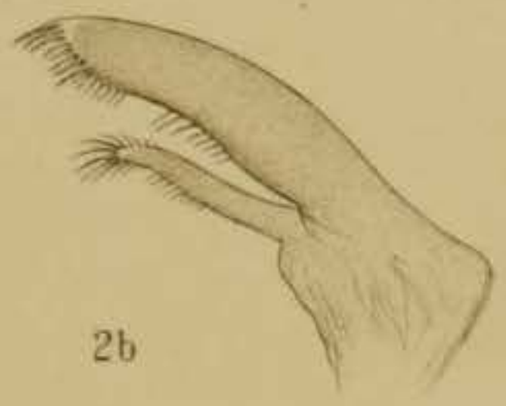

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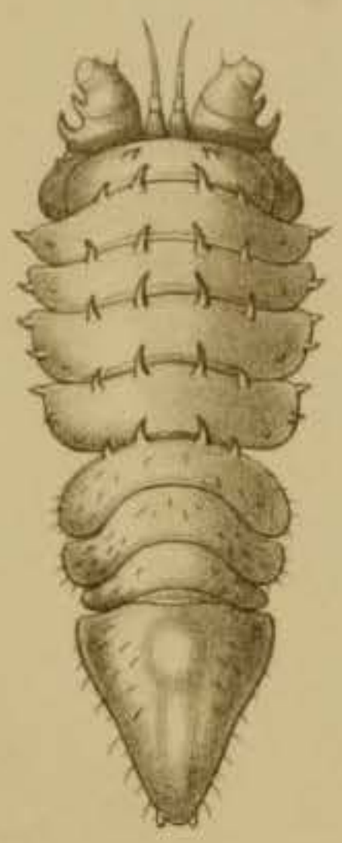

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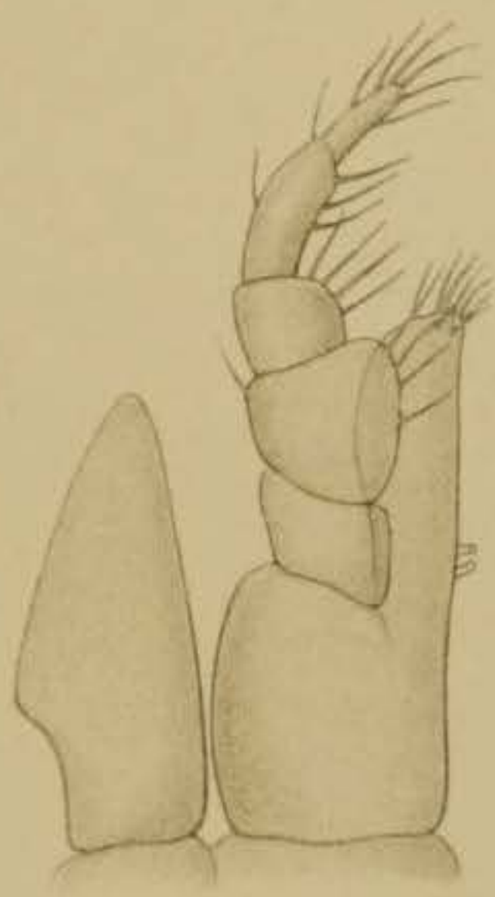

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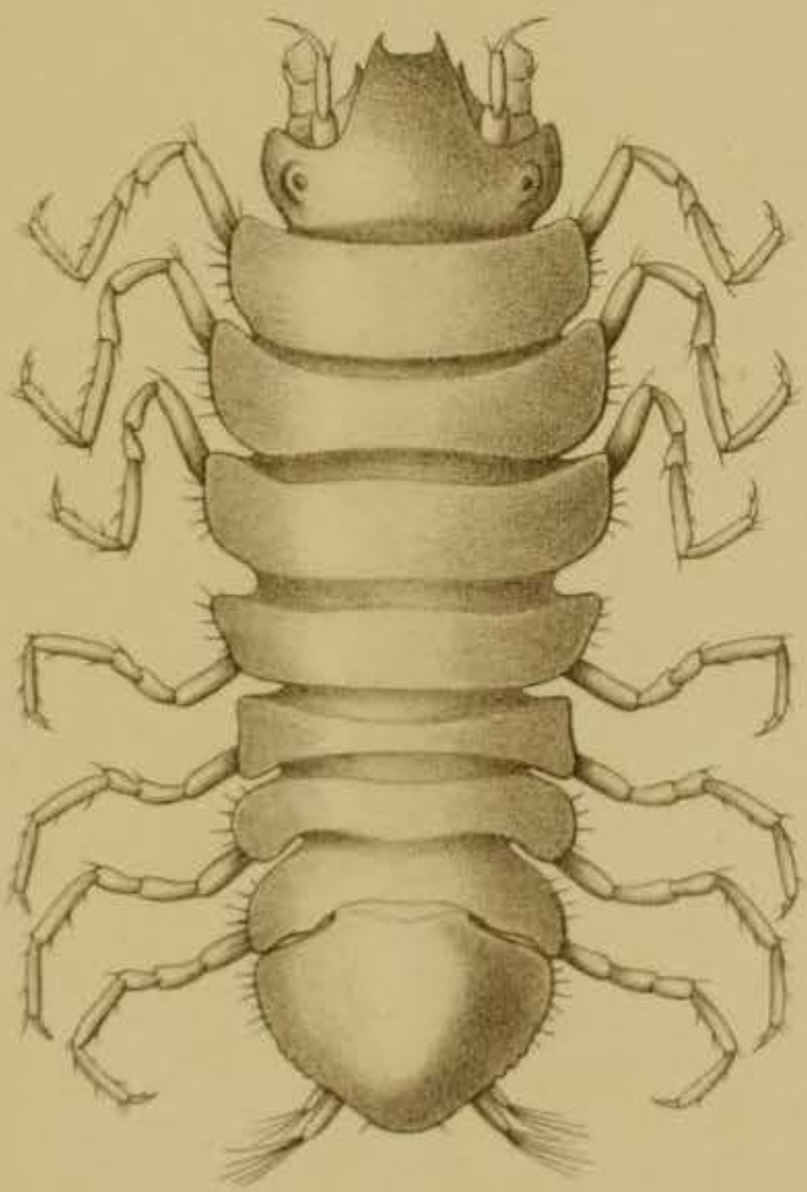

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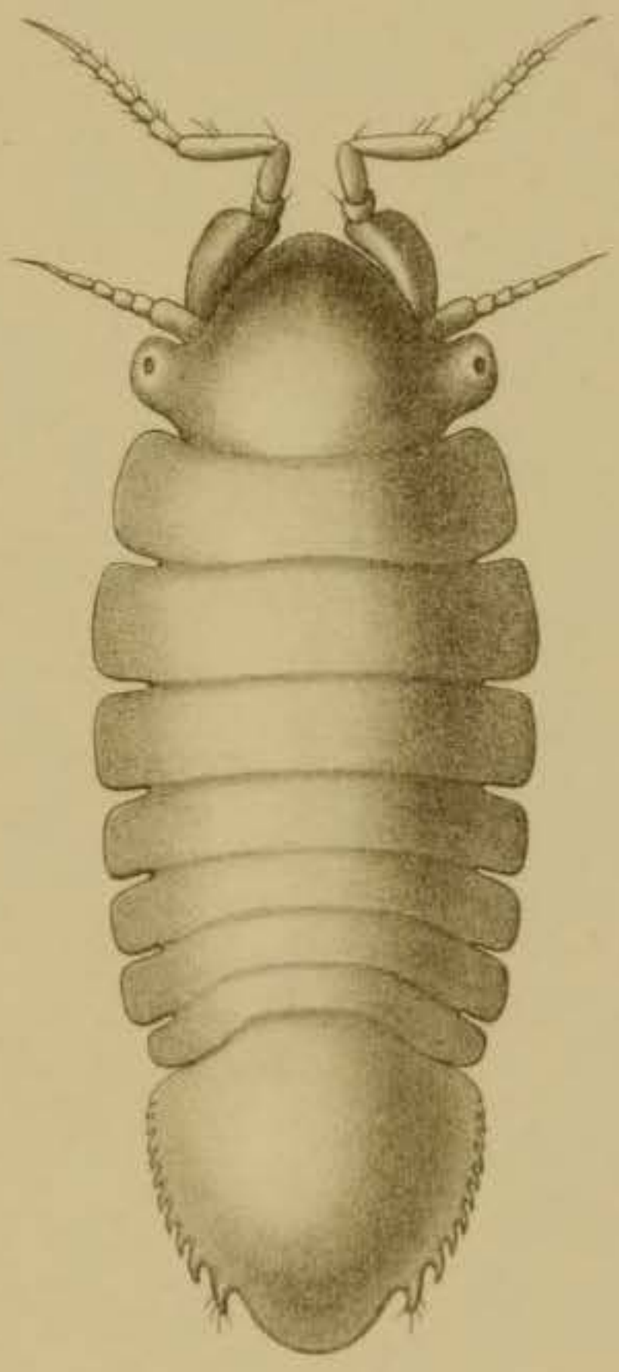

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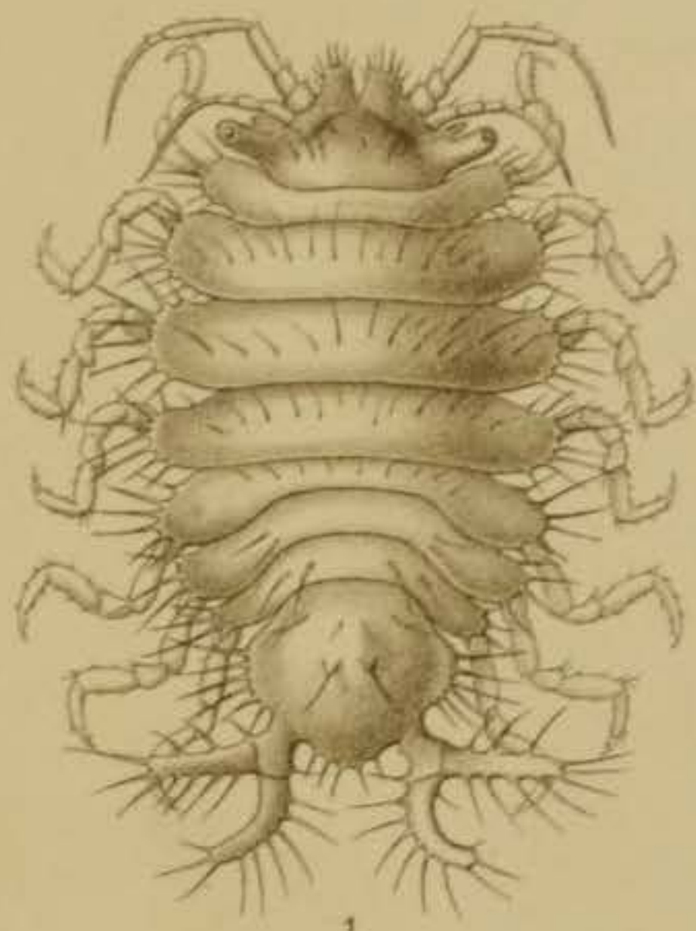
2a



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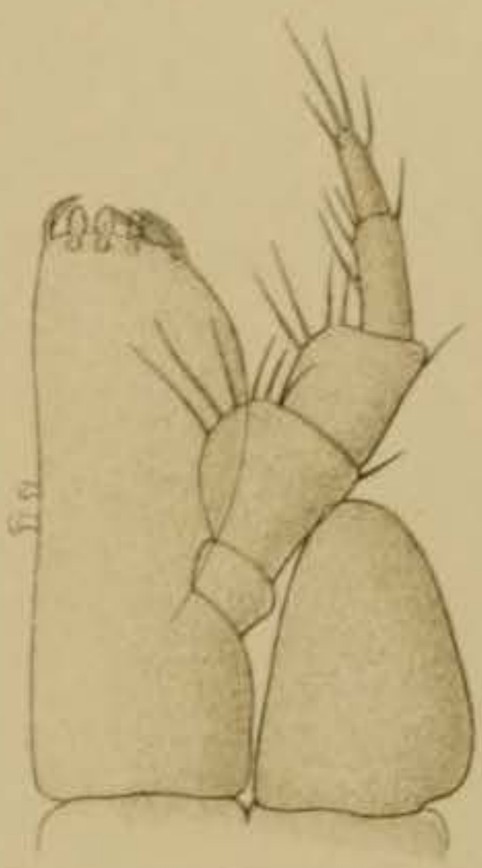

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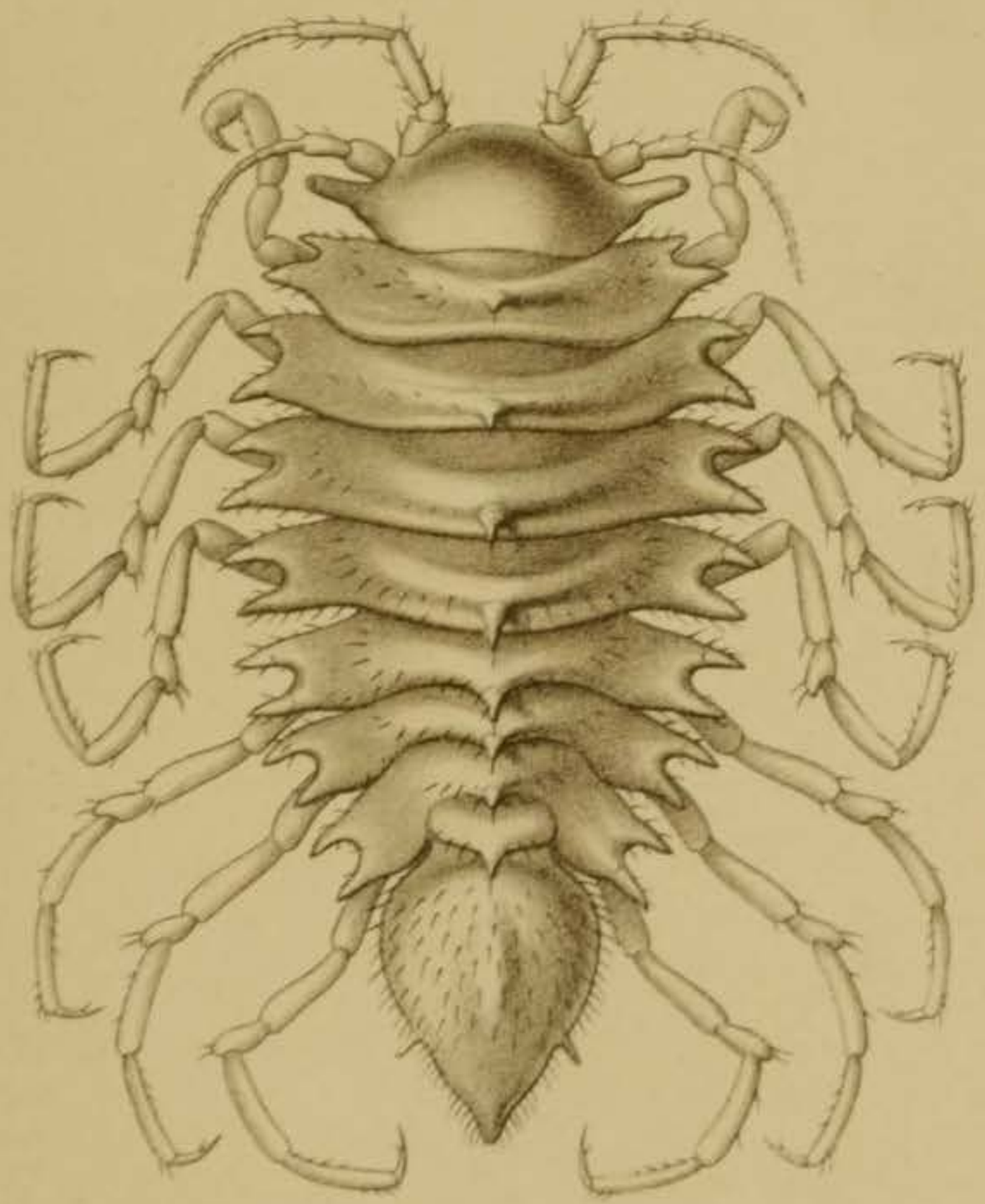

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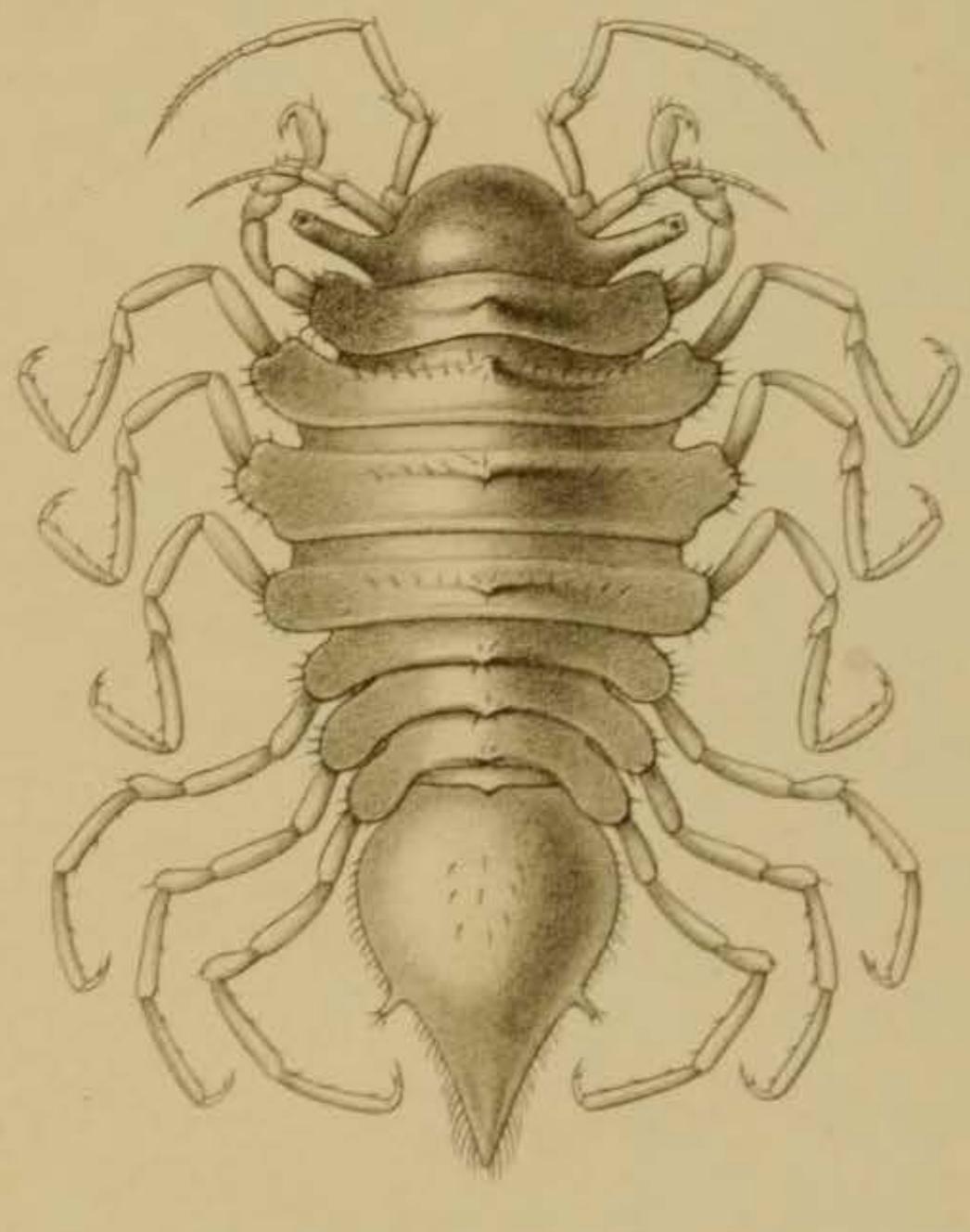

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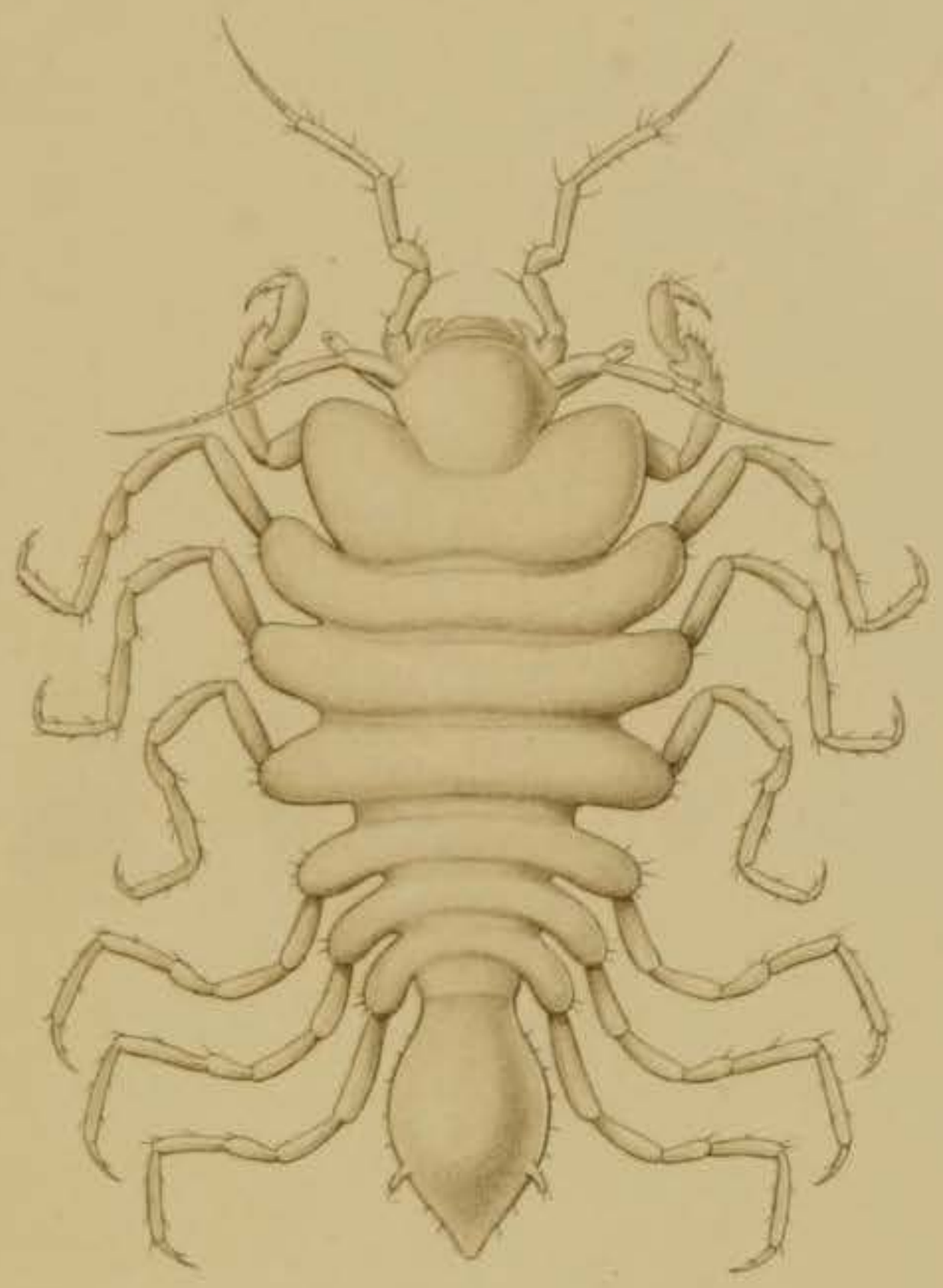

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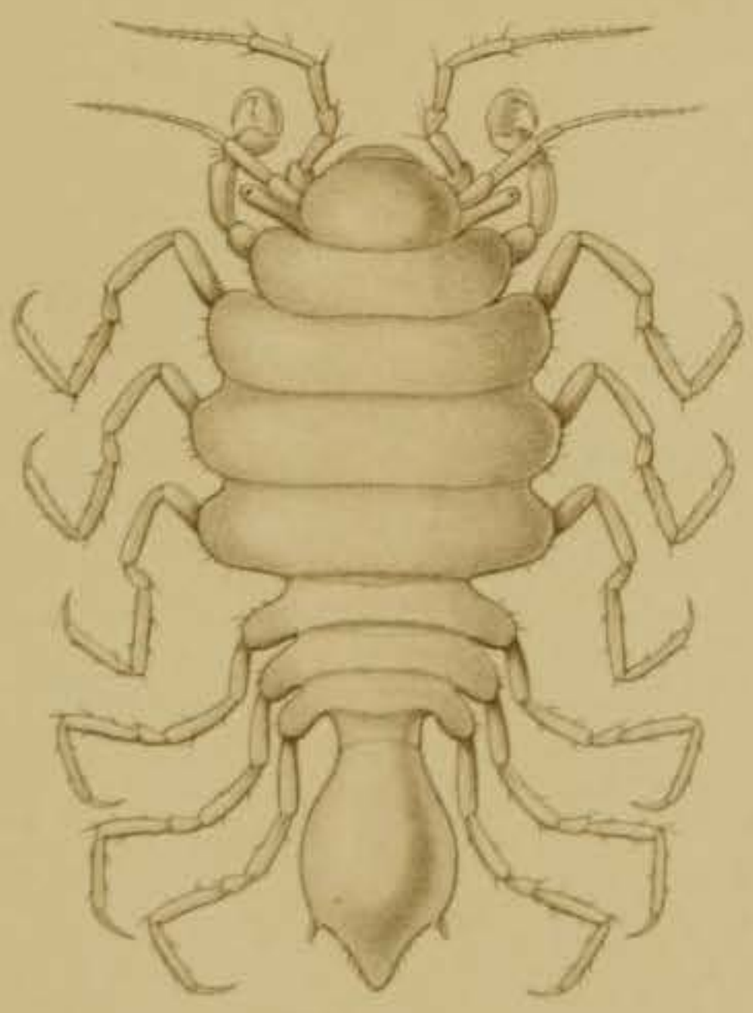

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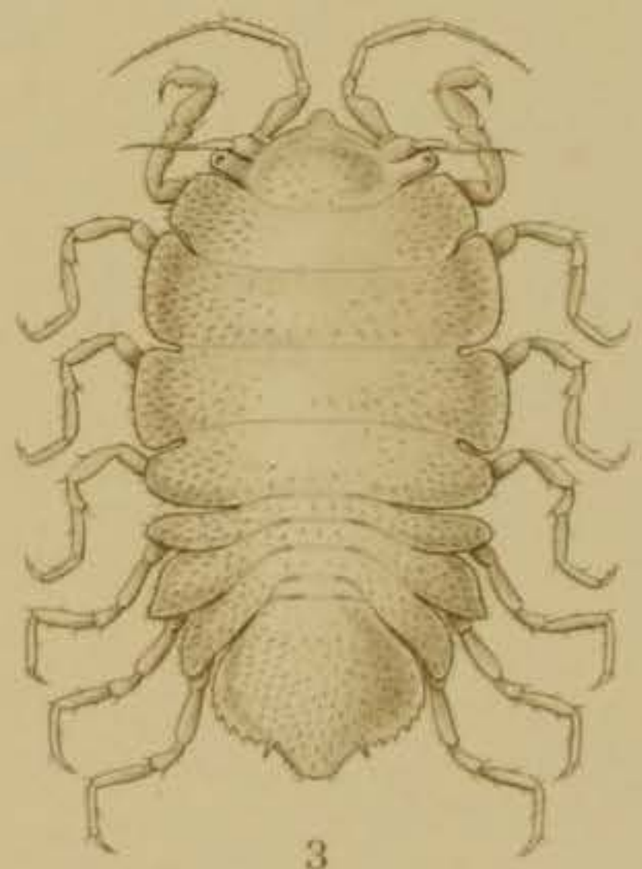

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West, Newman del et lith.

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