

# PYCNOGONIDA.

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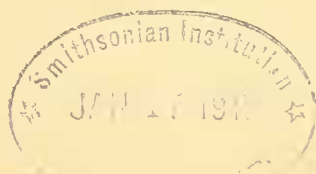
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## I.—INTRODUCTION.

THE collection of Pycnogonida obtained by the "Terra Nova" Expedition far exceeds in extent that of any Antarctic expedition yet reported on. It comprises no fewer than forty-four species,\* all from the Ross Sea area, with the exception of one species (*Colossendeis megalonyx*, Hoek) represented by a solitary specimen dredged near the Falkland Islands. Eleven species are described as new, while five others are identified with species only very recently described in Mr. Hodgson's (1914–15)† preliminary report on the Pycnogonida of the German South Polar Expedition. While none of the new species can be compared, in point of morphological or systematic interest, with the discoveries of earlier expeditions, they serve to accentuate

\* It may be of interest to give the numbers for some other Antarctic expeditions. Excluding names subsequently withdrawn by their authors, or definitely placed as synonyms in the present report, the "Discovery" obtained twenty-six species, the "Français" seven, the "Scotia" fifteen, the "Pourquoi Pas?" twenty-four, and the "Gauss" twenty-nine.

† The numbers enclosed within brackets refer to the list of papers at the end of the Report.



the remarkable richness of the Antarctic pycnogonidan fauna; and, at the same time, the fact that one species in every four in this collection has to be described as new helps to remind us how incomplete our knowledge of this fauna still is.

I wish to acknowledge the assistance that I have received from Mr. T. V. Hodgson, who has very kindly made available to me much of the unpublished results of his study of the "Gauss" collection, and has allowed me to borrow for examination the types of many of his new species. I am also under particular obligations to Prof. E. L. Bouvier, of Paris, for the generous way in which he has invariably responded to my requests for information and for specimens. I shall have, in the course of this report, to differ from Prof. Bouvier on several minor points and one or two major ones. It is the more fitting, therefore, that I should acknowledge here my great indebtedness to his illuminating report on the Pycnogonida of the "Pourquoi Pas?"

The figures illustrating this report have been prepared by Miss Gertrude M. Woodward.

## II.—LIST OF STATIONS AT WHICH PYCNOGONIDA WERE OBTAINED.

### *Subantarctic Zone.*

Station 38.—13th April, 1913, Lat.  $52^{\circ} 23' S.$ , Long.  $63^{\circ} 50' W.$  (W. of Falkland Islands). Depth, 125 fathoms. Agassiz trawl.

### *Antarctic Zone.*

Station 194.—22nd February, 1911, Lat.  $69^{\circ} 43' S.$ , Long.  $163^{\circ} 24' E.$  (off Oates Land). Depth, 180–200 fathoms. Agassiz trawl.

Station 220.—3rd January, 1912. Off Cape Adare, mouth of Robertson's Bay. Depth, 45–50 fathoms. Agassiz trawl.

Station 294.—15th January, 1913. Lat.  $74^{\circ} 25' S.$ , Long.  $179^{\circ} 3' E.$  (Ross Sea). Depth, 158 fathoms. Agassiz trawl.

Station 295.—27th January, 1913. Lat.  $73^{\circ} 51' S.$ , Long.  $172^{\circ} 57' E.$  (Ross Sea). Depth, 190 fathoms. Agassiz trawl.

Station 314.—23rd January, 1911. Five miles north of Inaccessible Island, McMurdo Sound. 222–241 fathoms. Agassiz trawl.

Station 318.—13th June to 16th September, 1911. Hole in ice between Cape Evans and Inaccessible Island. Depth, 130–180 metres. Traps and tangles on bottom.

Station 321.—13th–17th August, 1911. In contraction-crack between Inaccessible Island and Barne Glacier. Depth, 180–309 metres.

- Station 322.—3rd–4th September, 1911. In contraction-crack between Inaccessible Island and Barne Glacier. Depth, 20 metres. Fish-trap, dredge.
- Station 331.—14th January, 1912. Off Cape Bird Peninsula, entrance to McMurdo Sound. Depth, 250 fathoms. Dredge.
- Station 338.—23rd January, 1912. Lat.  $77^{\circ} 13' S.$ , Long.  $164^{\circ} 18' E.$  (entrance to McMurdo Sound). Depth, 207 fathoms. Agassiz trawl.
- Station 339.—24th January, 1912. Lat.  $77^{\circ} 5' S.$ , Long.  $164^{\circ} 17' E.$  (entrance to McMurdo Sound). Depth 140 fathoms. Agassiz trawl.
- Station 340.—25th January, 1912. Lat.  $76^{\circ} 56' S.$ , Long.  $164^{\circ} 12' E.$  (off Granite Harbour). Depth, 160 fathoms. Agassiz trawl.
- Station 349.—15th February, 1912. Off Butter Point, western shore of McMurdo Sound. Depth, 80 fathoms. Agassiz trawl.
- Station 355.—20th January, 1913. Lat.  $77^{\circ} 46' S.$ , Long.  $166^{\circ} 8' E.$  (McMurdo Sound). Depth, 300 fathoms. Agassiz trawl.
- Station 356.—22nd January, 1913. Off Granite Harbour, entrance to McMurdo Sound. Depth, 50 fathoms. Agassiz trawl.

### III.—LIST OF SPECIES.

#### FAMILY COLOSSENDEIDÆ.

- Colossendeis scotti*, sp. n.  
 „ *australis*, Hodgson.  
 „ *megalonyx*, Hoek.  
 „ *rugosa*, Hodgson.  
 „ *frigida*, Hodgson.  
 „ *wilsoni*, sp. n.  
 „ *glacialis*, Hodgson.  
 „ *drakei*, sp. n.  
 „ *robusta*, Hoek.  
 „ *lilliei*, sp. n.

#### FAMILY NYMPHONIDÆ.

- Pentanympyon antarcticum*, Hodgson.  
*Nymphon charcoti*, Bouvier.  
 „ *gracillimum*, sp. n.  
 „ *hiemale*, Hodgson.  
 „ *adareanum*, Hodgson.  
 „ *proximum*, sp. n.  
 „ *biarticulatum* (Hodgson) (?).  
 „ *mendosum* (Hodgson).  
 „ *australe*, Hodgson.

## FAMILY PHOXICHILIDÆ (PALLENIDÆ).

- Austropallene cornigera* (Möbius).  
 „ *brachyura* (Bouvier).  
 „ *tibicina*, sp. n.

## FAMILY PHOXICHILIDIIDÆ.

- Pallenopsis glabra* (Möbius).  
 „ *pilosa* (Hoek).  
 „ *vanhöffeni*, Hodgson.  
 „ *spicata*, Hodgson.  
*Phoxichilidium australe*, Hodgson.

## FAMILY ENDEIDÆ.

- Endeis australis* (Hodgson).

## FAMILY AMMOTHEIDÆ.

- Ammothea glacialis* (Hodgson).  
 „ *gibbosa* (Möbius).  
 „ *spinosa* (Hodgson).  
 „ *minor* (Hodgson).  
 „ *australis* (Hodgson).  
 „ *meridionalis*, Hodgson.  
 „ *striata* (Möbius) (?).  
*Achelia spicata* (Hodgson).  
 „ *intermedia*, sp. n.  
 „ *brucei*, sp. n.  
*Austroraptus polaris*, Hodgson.  
 „ *juvenilis*, sp. n.  
 „ *præcox*, sp. n.  
*Austrodecus glaciale*, Hodgson.  
*Rhynchothorax australis*, Hodgson.

## FAMILY PYCNOGONIDÆ.

- Pycnogonum gaini*, Bouvier.

## IV.—NOTES ON OCCURRENCE AND DISTRIBUTION.

Prof. Bouvier has remarked (1913, p. 18) on the growing preponderance of the Antarctic pycnogonidan fauna, as revealed by successive expeditions, over that of the Arctic regions, hitherto regarded as the special headquarters of the group. He states the number of Arctic and Antarctic species as 62 and 82 respectively. While these numbers may be subject to some modification according to the limits assigned to the geographical areas on the one hand, and to the specific groups on the other, it is at least clear that, with some 14 species to be added to the Antarctic list from the "Gauss" collection and 11 here described, the Antarctic seas are already known to be far richer in species of Pycnogonida than any similar area of the oceans.

As regards the numbers of individual specimens, it is to be noted that, out of a total of about 600 in the present collection, no fewer than 240 belong to a single species, *Nymphon australe*, and that, of these, 200 were obtained at a single station, and presumably at a single haul of the trawl. Again, the three closely allied species of *Achelia* (which are, perhaps, not more than forms of a single species) are together represented by more than a hundred specimens, of which all except three were taken together at a single station. Twenty-four species were obtained only at a single station each, and mostly in very small numbers. Against this we have *Ammonothea glacialis* from nine stations (25 specimens), *Nymphon mendosum* from eight (37 specimens), and *Colossendeis frigida* and *Pentanympyon antarcticum* each from seven stations (16 and 38 specimens respectively).

The depths at which Pycnogonida were obtained range from 11 to 300 fathoms. Within these limits there are no clear indications of any marked change in the fauna.

The high proportion of new species that Antarctic collections continue to yield, and the large number of species that are known only from one or a few occurrences, show that our knowledge of the Pycnogonid fauna of this region is still a very long way from approaching completeness. While it would be useless, for this reason, to attempt a detailed analysis of the distribution of the various species within the area, or of their relations to other species outside it, the following facts seem deserving of attention. Of the 48 species of Pycnogonida obtained from the Ross Sea area (off the coasts of Victoria Land) by the "Southern Cross" (Hodgson, 1902), "Discovery" (Hodgson, 1907), and "Terra Nova" expeditions, 15 are on the list of the "Gauss" (Hodgson, 1914-15) from Wilhelm Land, and 17 were obtained in the region of Graham Land (including the South Orkneys and South Shetlands) by the French (Bouvier, 1907 and 1913) and Scottish (Hodgson, 1908) expeditions. Five species are common to all three regions, and for these, at all events, a circumpolar distribution may be taken as proved, while it is at least highly probable in the cases of the other 12 species common to Graham Land and Victoria Land, and of the one (*Austropallene cristata* (Bouvier)) recorded from Graham Land and Wilhelm Land only. On the other hand,

the absence of *Decolopoda* from the extensive Ross Sea collections points to a restricted area of distribution for this genus, the two species of which have hitherto been taken only at the South Shetlands, South Orkneys, and Graham Land. A similarly limited range is more or less probable for several less conspicuous species, but cannot be regarded as established until a great deal more collecting has been done.

## V.—VARIATION AND SPECIFIC CHARACTERS.

Prof. G. H. Carpenter (1907, p. 95) writes: "Recent systematic work on the Pycnogonida has brought home to students that a great plasticity of structure characterises this group, and that in large genera it becomes increasingly difficult with advancing knowledge to form definite specific diagnoses. The publication of new specific names is therefore attended with more than usual risk, but the very fact that variation is so wide makes the careful study of forms from any new locality of special obligation and interest to the naturalist." Prof. Carpenter's words have special weight as coming from a zoologist experienced in the systematic study of many widely different groups of Arthropoda; nevertheless, it may be doubted whether, in this respect, the Pycnogonida differ so greatly from other large groups of marine arthropods as these words seem to suggest. The general impression gained from the study of such a collection as the present is much the same that would result from examination of many groups of Crustacea, for instance. Certain genera and families present large numbers of minutely separated species, the distinguishing characters of which have at least the appearance of inconstancy; while other groups are composed of few species easily and sharply defined by characters that are relatively invariable. To the first category plainly belong many of the species of *Colossendeis*, *Nymphon*, and *Achelia* discussed below. On the other hand, we have such forms as *Pycnogonum gaini*, the sole representative of its genus in the Antarctic, which ranges from Graham Land to the Ross Sea and Wilhelm Land without perceptible variation in its specific characters.

The question, however, deserves further study, since there are some reasons for expecting the Pycnogonida to be especially inclined to specific instability. Döderlein (1902) attributes great importance, among the factors favouring the development of local races, varieties, and species in any group of animals, to the lack of "Vagilität" or power of wandering, and Doflein has attempted to show how this "Döderleinsche Prinzip" applies to the case of the deep-sea Brachyura. Now, there are probably few groups of marine Arthropoda that are less "vagile" on the whole than the Pycnogonida. Although some species have the power of swimming in the adult state, their efforts seem to be awkward and inefficient, and none of the larvæ are better adapted for locomotion. Whatever may be the result in comparison with other Arthropoda, the application of the principle does not meet with very encouraging

results when the Pycnogonida are compared with one another. Of all Pycnogonida hardly any can be less "vagile," as adults or as larvæ, than the species of *Pycnogonum*; yet not only *P. gaini* mentioned above, but also the common *P. littorale* of our own coasts, show that the species may combine a very wide geographical range with a great constancy of specific characters.

## VI.—THE SIGNIFICANCE OF THE DECAPODOUS PYCNOGONS.

Although the present collection contains no species that throws new light on the major problems connected with the morphology and phylogeny of the Pycnogonida, it may not be out of place here to make a few observations on points raised in Prof. Bouvier's Report on the Pycnogonida of the "Pourquoi Pas?"

Prof. Bouvier pays the compliment of serious criticism to a little essay (1909), in which I supported the view (first put forward by Prof. G. H. Carpenter) that the decapodous condition among Pycnogons is not a primitive survival but a recent specialisation. The argument on which I chiefly relied was based on the fact that *Decolopoda* and *Pentanymphon*, the only decapodous genera then known, are by no means nearly related to one another, but exhibit the closest affinity respectively with *Colossendeis* and *Nymphon*, two of the normal octopodous genera. This argument was greatly strengthened, as I have elsewhere pointed out (1910), by Prof. Bouvier's discovery of *Pentapycnon*, a decapodous genus widely removed from the other two, but approximating very closely indeed to *Pycnogonum*; and, while *Decolopoda* and *Pentanymphon* can, without much difficulty, be admitted as reasonably primitive forms, *Pycnogonum* and, with it, *Pentapycnon*, can only be regarded as among the most highly specialised of existing Pycnogons. On the other hand, the support which my contention seemed to draw from the fact that all three decapodous genera occurred only within a restricted geographical area has been quite destroyed by Prof. Bouvier's later discovery of a species of *Pentapycnon* on the coast of French Guiana—one of the last places in the world where one would look for a fauna with antarctic affinities.

Prof. Bouvier's argument for the primitive nature of the decapodous forms depends, in the first place, on the admitted fact that *Decolopoda* is, in one respect (apart from the number of somites), less specialised than its relative *Colossendeis*; it retains, in the adult state, the chelophores with a biarticulate scape that are present only in the young stages in the last-named genus. Now it may be conceded that, if *Decolopoda* stood alone, it might be "simpler and perfectly logical" to suppose that *Colossendeis* had been derived from it by the loss of two primitive characters, the chelophores and the posterior pair of legs; but when we have to extend a similar supposition to *Pentanymphon* and, still more, to *Pentapycnon*, the argument, though

still logical and simple, becomes inadequate to support the weighty conclusions that must be based on it.

At this point Prof. Bouvier attributes to Prof. Carpenter and myself an opinion that I, at least, do not hold. He writes: "Au surplus si, comme le pensent M. Carpenter et M. Calman, la paire de pattes postérieures est une paire surajoutée dans les types décapodes, les orifices sexuels des *Pentapycnon* devraient se trouver à la même place que chez les *Pycnogonum*, à savoir sur les pattes de la quatrième paire, alors qu'ils sont situés sur la cinquième." He proceeds to argue that the somite which has disappeared in the oetopodous forms is not the fifth but the fourth, on the ground that the dorsal tubercle corresponding to this somite in *Pentapycnon* persists in *Pycnogonum* although the somite itself has disappeared. Clearly, however, this evidence might be read in another way. Instead of assuming a transference of the dorsal tubercle from the penultimate somite of *Pentapycnon* to the last somite of *Pycnogonum*, we might take the fourth pedigerous somite as homologous in the two genera, and assume a transference of the genital apertures from the fifth somite to the fourth. As a matter of fact, however, there is no evidence at all for the existence of individual homologies between the somites of the two genera. Bateson pointed out long ago the fallacy of the assumption that in variation the individuality of each member of a meristic series is always respected. In writing of "an additional pair of legs" I had not in mind any particular one of the five pairs. There is nothing to prevent us from regarding the series of somites as having been remodelled as a whole in passing from one genus to the other.

In support of the contention that "the constancy in the number of somites and appendages throughout the comparatively wide range of structure presented by the eight-legged Pycnogons strongly suggests that this is the deep-seated and, so to speak, 'normal' plan of structure of the group" from which the ten-legged condition is a secondary departure, I called attention to the parallel case of *Polyartemia* among the Branchiopod Crustacea. *Polyartemia* differs from the normal type of the Order Anostraca, to which it belongs, in having nineteen instead of eleven pre-genital trunk somites; and since the number appears to be constantly ten or eleven in the other Orders of Branchiopoda (excluding the abbreviated Cladoeera), there seems to be good ground for suggesting that the increased number in this case is due to secondary specialisation. Prof. Bouvier quotes against me the authority of Dr. E. von Daday (1910, p. 411), who considers *Polyartemia* to be the most primitive of the Anostraca. I find nothing in Daday's discussion of the question to lead me to change my opinion. He makes no mention of the position of the genital opening in comparing the Anostraca with the other Orders of Branchiopoda; and his reference to the supposed persistence of a vestige of the mandibular palp in *Polyartemia* overlooks entirely the fact that the palp is in all cases present in the nauplius.

It would be easy to multiply parallel instances from other groups of the animal kingdom, but, as Bouvier reminds us, "il ne convient pas d'étendre à un groupe les



considérations phylogénétiques applicables à un autre." I only refer, therefore, to one case among fishes, to which Mr. C. Tate Regan has called my attention, where the parallel seems unusually simple and complete. Until recently, the only Selachians known to have more than five pairs of branchial arches were the Notidanoid sharks, and as these are, in other respects, generalised and ancient types, the increased number of arches may, not unreasonably, be regarded as a primitive character. Mr. Regan (1906, p. 1), however, has described under the name *Pliotrema* a Pristiophorid shark which has six arches. There can be no question that this is a very highly specialised form, and that it has been derived from some form like *Pristiophorus* with the normal number of branchial arches. The parallel between *Pliotrema* and *Pentapycnon* in their relations to *Pristiophorus* and *Pycnogonum* respectively seems to me very striking, and it is hard to believe that arguments regarded as conclusive in one case can be without value in the other.

## VII.—NOMENCLATURE AND TERMINOLOGY.

In this report certain nomenclatorial changes suggested by recent authors have been adopted, although they involve the rejection of long-established names or even their transference in a manner against which I have elsewhere ineffectually protested. They are adopted because they appear to comply with the only code of rules that commands any general assent at the present time; and because when once such changes have been introduced in works of authority it is hopeless to try to prevent their ultimate adoption.

The terms used for the parts of the animal in the descriptions are, in the main, those adopted by Prof. D'Arcy W. Thompson (1909) with some modifications that do not call for special explanation. In the measurements, the "length of trunk" is taken from the frontal margin of the head above the proboscis in the middle line to the base of the abdomen, or the anterior margin of its socket if it is articulated; the "cephalon" is regarded as extending from the frontal margin to the base of the first pair of lateral processes; the "cephalic segment" is measured from the frontal margin to the line of articulation between the first and second pairs of lateral processes.

## VIII.—SYSTEMATIC NOTES AND DESCRIPTIONS OF NEW SPECIES.

### GENUS COLOSSENDEIS, Jarzynsky.

Mr. Hodgson has described, from the collections of the "Gauss," a species which he makes the type of a new genus under the name of *Notoendeis germanica*. I have not seen the type-specimen, but, to judge from the preliminary account, the genus would seem to be of doubtful validity. The only characters mentioned that are in any

way distinctive are the "perfectly-segmented" body and the "nine-jointed" palps.\* The first character is shared by two species of *Colossendeis*, *C. articulata* and *C. dofleini* of Loman (1908, p. 22, and 1911, p. 4). As regards the second character, *N. germanica* agrees in this, but, apparently, in no other respect, with the species described below as *C. wilsoni*. If the genus were to be retained it would be hard to decide whether it should include *C. articulata* and *C. dofleini* on the one hand or *C. wilsoni* on the other; it could not embrace all three.

A large number of species of *Colossendeis* have been described, most of them from a very small number of specimens. They are distinguished mainly by proportional differences of measurement, and there is reason to believe that some of them would not survive a critical revision based on adequate collections. In the absence of such a revision it is necessary, before venturing to describe any additional species, to attempt to reduce to some sort of order those already known. Bouvier has made a beginning by dividing the species into two groups according to the relative lengths of the distal segments of the legs. In the first or "longitarsal" group the carpus, propodus, and claw together measure at least three-quarters of the length of the second tibia; in the "brevitarsal" group the proportion is always very much less. Proceeding on these lines, the following key may be offered for the "longitarsal" group, which includes all the Antarctic species.

*Key to the "Longitarsal" species of Colossendeis.*

- a. Sixth segment of palp more than three times as long as thick. Proboscis distinctly longer than trunk.
- a'. Trunk segmented . . . . . *C. articulata*, Loman
- b'. Trunk not segmented.
- a". Lateral processes in contact.
- a"". Seventh segment of palp longer than eighth. Eyes absent . . . *C. proboscidea* (Sabine)
- b"". Seventh segment of palp shorter than eighth. Eyes present . . . *C. scotti*, sp. n.
- b". Lateral processes separated.
- a"". Seventh segment of palp equal to eighth . . . . . *C. australis*, Hodgson  
{ *C. media*, Hoek †  
{ *C. brevipes*, Hoek
- b"". Seventh segment of palp distinctly shorter than eighth.
- a"". Eyes absent.
- a"". Proboscis dilated distally . . . . . *C. orcadensis*, Hodgson
- b"". Proboscis dilated in middle . . . . . { *C. angusta*, G. O. Sars †  
{ *C. gracilis*, Hoek

\* I learn from Mr. Hodgson that he does not accept the view of Bouvier (1913, p. 37), according to which only nine segments are counted in the palp of normal species of *Colossendeis*. Bouvier, no doubt rightly, excludes from the enumeration the "saillie basilaire" of the palps, which is generally counted as a segment, although it is precisely similar to the process (never reckoned as a segment) that lies alongside it and carries the oviger. Loman is said by Bouvier to have been the first to call attention to this point, but I cannot discover the passage in which he did so.

† *C. media* and *C. brevipes* were described by Hoek as doubtfully distinct from *C. gracilis*, which again is identified by Möbius with *C. angusta*. Meinert's observation (1899, p. 59) as to the differences in form of the palpal segments in immature and fully adult specimens of the last-named species deserves to be noted as having possibly a wider application.

- b*<sup>'''</sup>. Eyes present.
- a*<sup>''''</sup>. Claw nearly equal to propodus. . . . . *C. megalonyx*, Hoek
- b*<sup>''''</sup>. Claw not more than two-thirds of propodus.\*
- Legs spiny . . . . . *C. rugosa*, Hodgson
- Legs smooth . . . . . *C. frigida*, Hodgson
- b*. Sixth segment of palp not more than twice as long as thick. Proboscis, at most, hardly longer than trunk.
- a*<sup>'</sup>. Lateral processes in contact . . . . . *C. wilsoni*, sp. n.
- b*<sup>'</sup>. Lateral processes separated.
- a*<sup>''</sup>. Femur longer than second tibia.
- a*<sup>'''</sup>. Sixth segment of palp longer than seventh . . . . . *C. glacialis*, Hodgson  
(*C. gracilipes*, Bonvier)
- b*<sup>''</sup>. Sixth segment of palp shorter than seventh . . . . . *C. drakei*, sp. n.
- b*<sup>''</sup>. Femur not longer than second tibia.
- a*<sup>'''</sup>. Lateral processes separated by their own diameter . . . . . *C. robusta*, Hoek
- b*<sup>'''</sup>. Lateral processes separated by less than their own diameter . . . . . *C. lilliei*, sp. n.

*C. patagonica*, Hodgson, described from an imperfect specimen and not figured, appears to be allied to *C. glacialis*, Hodgson.

It may be worth while here to give the names of the species included in the "brevitarsal" group as far as I have been able to collect them. They are *C. gigas*, *leptorhynchus*, *minuta*, and *japonica* of Hoek, *colossea* and *macerrima* of Wilson, *clavata*, Meinert, *bicincta* and *subminuta*, Schimkewitsch, *eucurbita*, Cole, *gardineri*, Carpenter, *dofleini*, Loman, and *michaelsarsii*, Olsen.

*Colossendeis scotti*, sp. n. (Text-fig. 1).

*Occurrence*.—Station 294, Ross Sea, 158 fathoms; 1 ♂ (Holotype), 1 ♀.

*Description*.—*Trunk* compact, its greatest width across the first pair of lateral processes more than two-thirds of its length; lateral processes almost or quite in contact with each other except the third and fourth pairs, which are separated by a small interval; inter-segmental lines very indistinct. Ocular tubercle bluntly conical or rounded at the tip, not occupying more than one-third of width of cephalic segment; eyes dark, sharply defined, anterior pair hardly larger than posterior. On dorsal surface behind ocular tubercle is a convex area defined posteriorly by a crescentic groove; no anterior tubercles on cephalon.

*Proboscis* decurved, more than twice as long as trunk, narrow and cylindrical for the first quarter of its length, then expanding to nearly twice the width at about the middle, narrowing again to a slight terminal dilatation where it measures about five-sixths of its greatest width. Mouth-opening conspicuously wide, the labial teeth apparently smaller, or at least capable of further retraction than in allied species.

*Abdomen* shorter than greatest diameter of proboscis, decurved, cylindrical, blunt.

*Palp* with second segment a little less than twice as long as fourth; sixth longer than fifth and nearly four times as long as thick; seventh shorter than its width and

\* But see remarks on *C. rugosa* below.

less than half as long as eighth; ninth longer than eighth and, together with it, equal to sixth. The whole palp beset with spinules, most numerous on distal segments.

*Oviger* with fourth segment equal to sixth. Special spines of the distal segments in four rows with some additional spines irregularly placed. At the distal end of last segment is a large curved spine opposed to the claw and forming with it a sub-chelate termination to the limb (Text-fig. 1D). All the segments of the oviger are hispid.

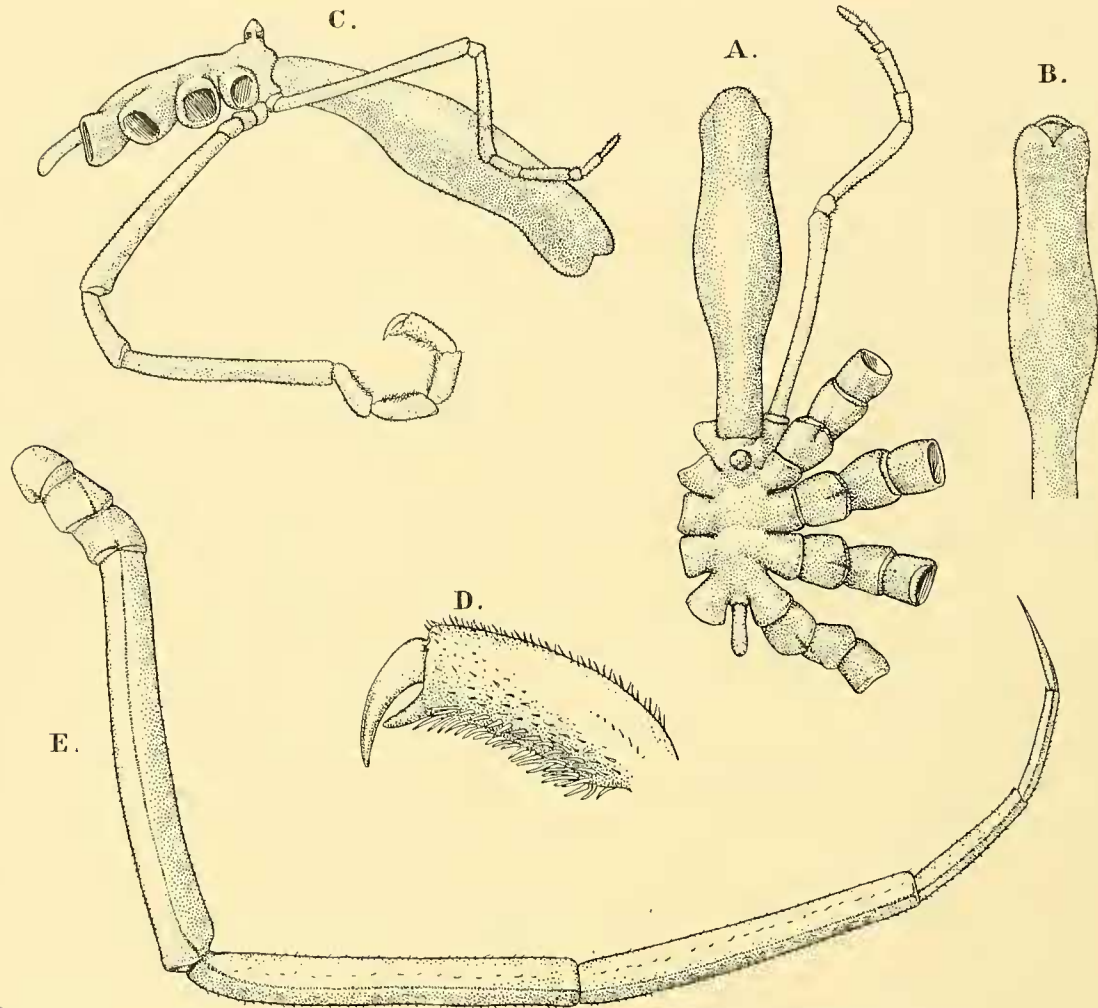


FIG. 1.—*Colossendeis scotti*, sp. n., Male. A. Dorsal view of body with palp and coxæ of one side. B. Ventral view of proboscis. C. Lateral view of body with palp and oviger. D. Terminal segment of oviger, further enlarged. E. Third leg of right side.

*Legs* rather stout, femur not more than nine times as long as thick. Femur and first and second tibiæ successively decreasing in length. Tarsus a little longer than, and claw nearly equal to, propodus.

Surface of body nearly smooth, proboscis with scattered setæ becoming more numerous at the tip, legs set with very short spinules, which are more numerous, and arranged in rows, on the distal segments.

*Measurements, in mm.—*

	(Holotype.)	
	♂	♀
Length of proboscis . . . . .	31·0	35·25
Greatest diameter of proboscis . . . . .	6·25	7·0
Length of trunk . . . . .	13·75	16·25
Width across first lateral processes . . . . .	10·0	11·5
Length of abdomen . . . . .	5·75	6·0
Third right leg—		
Coxæ . . . . .	10·5	12·0
Femur . . . . .	33·5	40·0
First tibia . . . . .	31·0	37·5
Second tibia . . . . .	28·25	32·5
Tarsus . . . . .	11·0	12·0
Propodus . . . . .	9·5	9·0
Claw . . . . .	9·0	7·5
Palp—		
Second segment . . . . .	16·25	19·5
Third    " . . . . .	1·28	2·0
Fourth   " . . . . .	8·8	11·2
Fifth    " . . . . .	3·2	4·0
Sixth    " . . . . .	4·24	5·2
Seventh   " . . . . .	·8	1·12
Eighth   " . . . . .	2·0	2·4
Ninth    " . . . . .	2·24	2·8

*Remarks.*—In the relative lengths of the distal segments of the palp this species approaches the group of species related to *C. angusta*, but it differs widely from these not only in the much greater size of the proboscis, but also in the approximation of the lateral processes, in which respect it differs from all the "longitarsal" species except *C. proboscidea* and the new form described below as *C. wilsoni*. Among the species of this genus the curious chelate termination of the ovigers is only paralleled, so far as I know, in *C. australis*, but a similar condition is found in *Böhmia chelata* (Böhm) and *Rhopalorhynchus tenuissimus* (Haswell). The labial teeth are found in various degrees of retraction in preserved specimens of other species, and the widely gaping mouth of the specimens described above is partly due to this condition; but I think that the teeth themselves are unusually small and the triangular mouth-frame is relatively larger than in any species with which I have compared it.

The name of this, one of the largest species of Pycnogonida yet brought from Antarctic seas, is chosen to commemorate the heroic and ill-fated Leader of the Expedition by which it was obtained.

*Colossendeis australis*, Hodgson.

*C. australis*, Hodgson, 1907, p. 59, Pl. ix, fig. 1, Pl. x, figs. 1 and 2; Bouvier, 1913, p. 63, text-figs. 20 and 21.

*Occurrence*.—Station 294, Ross Sea, 158 fathoms; 1 ♂. Station 314, McMurdo Sound, 222–241 fathoms; 2 immature.

<i>Measurements, in mm.</i> —	"Terra Nova." Stn. 294. ♂	"Discovery."	
		Holotype. ♂	Paratype. ♀
Length of proboscis . . . . .	34·0	32·0	34·0
Greatest diameter of proboscis . . . . .	7·5	6·5	8·0
Length of trunk . . . . .	20·0	19·0	20·5
Width between first and second lateral processes . . . . .	4·5	3·8	5·0
Width across second lateral processes . . . . .	12·0	11·5	12·75
Length of abdomen . . . . .	5·0	4·5	5·75
Third right leg—			
Coxæ . . . . .	10·5	10·25	11·75
Femur . . . . .	30·0	27·0	27·25
First tibia . . . . .	30·5	28·5	27·75
Second tibia . . . . .	31·25	28·5	26·75
Tarsus . . . . .	12·25	12·5	11·25
Propodus . . . . .	7·4	7·25	7·0
Claw . . . . .	3·5	3·0	2·5
Palp—			
Second segment . . . . .	22·0	—	20·25
Third " . . . . .	2·0	—	2·0
Fourth " . . . . .	11·25	—	10·0
Fifth " . . . . .	2·5	—	2·75
Sixth " . . . . .	4·5	—	4·5
Seventh " . . . . .	2·5	—	2·75
Eighth " . . . . .	2·5	—	2·75
Ninth " . . . . .	3·25	—	3·5

*Remarks*.—The figure of this species in Hodgson's memoir (Pl. IX., fig. 1) shows the lateral processes much too near together. In reality the constricted bases of the second and third pairs are separated by a space about equal to their own diameter. Bouvier's figure of the lateral aspect possibly errs somewhat in the opposite direction. In the more slender terminal segments of the palp the adult male in the present collection agrees better with the male upon which Hodgson's description was based (and which may be regarded as the holotype) than with the female paratype. The other differences noticed by Hodgson between his two specimens do not seem to be

of importance. Bouvier's measurements of his single specimen show some differences of proportion, the proboscis in particular being a little longer and noticeably more slender, especially in the distal third.

The adult male in the "Terra Nova" collection shows a very well-developed sub-chelate termination of the ovigers like that described above in *C. scotti*. In the type-specimens from the "Discovery" the spines of the ovigers are very much worn (in the male only the sockets are left), and the enlargement of the distal spine to form a "thumb" is not so easily seen. In the immature "Terra Nova" specimens the distal spine is not enlarged.

The dorsal gland-openings of the second coxæ, not visible in Bouvier's specimen, are easily seen in our adult specimens of both sexes.

*Colossendeis megalonyx*, Hoek.

*C. megalonyx*, Hoek, 1881, p. 67, Pl. ix, figs. 1-3.

*Occurrence*.—Station 38, near Falkland Islands, 125 fathoms; 1 ♂.

*Measurements, in mm.*—

	"Terra Nova."	"Challenger." Holotype.
	♂	♂
Length of proboscis . . . . .	21·0	20·0
Greatest diameter of proboscis . . . . .	3·36	3·28
Length of trunk . . . . .	12·0	11·0
Width between first and second lateral processes	2·62	2·5
Width across second lateral processes . . . . .	8·25	7·5
Length of abdomen . . . . .	3·08	2·8
Third right leg—		
Coxæ . . . . .	8·0	7·0
Femur . . . . .	27·25	22·75
First tibia . . . . .	24·75	21·0
Second tibia . . . . .	21·5	17·75
Tarsus . . . . .	12·0	10·25
Propodus . . . . .	9·5	8·0
Claw . . . . .	7·75	7·0
Palp—		
Second segment . . . . .	10·64	9·36
Third        " . . . . .	·96	·8
Fourth       " . . . . .	7·6	6·56
Fifth         " . . . . .	2·4	2·24
Sixth        " . . . . .	2·96	2·72
Seventh     " . . . . .	·8	·72
Eighth      " . . . . .	1·6	1·6
Ninth       " . . . . .	1·6	1·6

*Remarks.*—The only specimens of this species remaining in the "Challenger" collection are five from Station 313 (East coast of Patagonia). The largest of these, a male, is that of which measurements are given by Hoek and supplemented above, and it may be selected as the holotype.

The specimen obtained by the "Terra Nova" is in close agreement with the holotype, and, like it, differs from specimens of *C. frigida* not only in the greater relative length of the claws, but also in the form of the proboscis, the distal part of which is nearly cylindrical, with hardly a trace of a sub-terminal constriction.

It is to be noted, however, that the specimens accompanying the holotype in the "Challenger" collection are by no means exactly like it or like one another. The three smallest specimens (regarded by Hoek as immature, but having distinct genital openings) have the proboscis, at most, only a little longer than the trunk and distinctly contracted beyond the proximal dilatation. One specimen, in which the proboscis is only equal in length to the trunk, and the legs distinctly shorter and stouter than in any of the others, is further remarkable in having the tarsus actually shorter than the propodus. Another specimen has the seventh palpal segment no longer than wide.

These differences, if the specimens are correctly referred to a single species, imply a range of variability that must throw doubt on the validity of other closely-related species in the genus.

It is much to be regretted that the specimen from Kerguelen, referred by Hoek to this species, is no longer in the "Challenger" collection.

*Colossendeis rugosa*, Hodgson.

*C. rugosa*, Hodgson, 1907, p. 64, Pl. ix, fig. 4, Pl. x, fig. 7.

*Occurrence.*—Station 294, Ross Sea, 158 fathoms; 1 ♂.

*Measurements, in mm.*—

	"Terra Nova."	"Discovery."
	♂	♂
Length of proboscis . . . . .	21·0	13·25
Greatest diameter of proboscis . . . . .	3·1	2·0
Length of trunk . . . . .	9·8	8·5
Width between first and second lateral processes	2·25	1·6
Width across second lateral processes . . . . .	6·5	5·6
Length of abdomen . . . . .	2·3	1·52
Third right leg—		
Coxæ . . . . .	5·5	5·5
Femur . . . . .	26·0	23·6
First tibia . . . . .	22·0	19·0
Second tibia . . . . .	21·0	18·0
Tarsus . . . . .	12·0	7·76
Propodus . . . . .	8·5	6·5
Claw . . . . .	6·0	5·5



Palp—	“ Terra Nova.”		“ Discovery.”
	♂		♂
Second segment . . . . .	10·64		7·2
Third „ . . . . .	·96		·72
Fourth . . . . .	7·68		4·88
Fifth . . . . .	2·16		1·76
Sixth „ . . . . .	2·8		2·72
Seventh . . . . .	·4		·64
Eighth „ . . . . .	1·52		1·6
Ninth „ . . . . .	1·84		2·16

*Remarks.*—The specimen that I record under this name agrees with the holotype of *C. rugosa*, and differs from the specimens included under *C. frigida* in the combination of the following characters:—

- (1) The legs are distinctly, though minutely, spiny, and traces of a median row of spines can be discovered on the proboscis.
- (2) The seventh segment of the palp is not longer than wide.
- (3) The distal contraction of the proboscis is rather more marked.

On the other hand, it is to be noted that the legs of *C. frigida* are never entirely devoid of minute spinules, and the present specimen is not so conspicuously spiny as the holotype of *C. rugosa*; that in one or two of the specimens referred to *C. frigida*, the seventh palpal segment is hardly longer than wide, and that, in the present specimen, the claw is no longer relatively to the propodus than in certain specimens referred to *C. frigida*, while in the holotype of *C. rugosa* it nearly reaches the proportions found in *C. megalonyx*.

In view of the wide range of variation attributed to *C. frigida*, it seems likely that *C. rugosa* will prove to be only a spinose form of that species.

*Colossendeis frigida*, Hodgson.

*C. frigida*, Hodgson, 1907, p. 63, Pl. ix, fig. 3, Pl. x, figs. 5 and 6.

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 1 ♂, 1 ♀. Station 294, Ross Sea, 158 fathoms; 1 ♀ (?), 2 ♂ (?). Station 314, McMurdo Sound, 222–241 fathoms; 1 ♀. Station 331, Entrance to McMurdo Sound, 250 fathoms; 2 ♀. Station 338, Entrance to McMurdo Sound, 207 fathoms; 4 ♀, 1 ♂. Station 340, off Granite Harbour, 160 fathoms; 1 ♂. Station 349, McMurdo Sound, 80 fathoms; 1 ♀, 1 ♂.

*Measurements, in mm.*—

	“ Terra Nova.”			“ Discovery.”	
				Syntypes.	
	Stn. 349.	Stn. 338.	Stn. 220.	5 fms.	130 fms.
	♂	♀	♂	♀	♂
Length of proboscis . . . . .	19·25	14·75	16·75	19·2	19·75
Greatest diameter of proboscis	2·88	2·24	2·96	4·0	3·28

	"Terra Nova."			"Discovery."	
	Stn. 349.	Stn. 338.	Stn. 220.	Syntypes.	
	♂	♀	♂	5 fms.	130 fms.
	♀	♂	♀	♂	
Length of trunk . . . . .	9·25	7·0	9·0	11·0	9·75
Width between second and third lateral processes . . . . .	2·4	1·52	2·56	2·8	2·72
Width across second lateral processes . . . . .	7·0	7·3	7·0	8·8	8·0
Length of abdomen . . . . .	2·0	1·84	2·24	2·48	2·4
Third leg (right or left)—					
Coxæ . . . . .	7·0	5·25	6·75	8·2	7·5
Femur . . . . .	26·2	21·0	20·5	23·5	24·0
First tibia . . . . .	23·5	20·0	18·5	21·3	21·5
Second tibia . . . . .	22·25	19·0	17·0	19·25	19·25
Tarsus . . . . .	13·0	9·36	10·0	11·0	11·5
Propodus . . . . .	9·2	6·0	8·75	8·5	9·6
Claw . . . . .	4·88	4·24	4·0	4·15	5·44
Palp—					
Second segment . . . . .	10·0	8·24	8·4	10·3	—
Third    "    . . . . .	·8	·8	·96	·96	—
Fourth   "   . . . . .	6·56	5·12	6·0	7·2	—
Fifth    "   . . . . .	2·08	1·6	1·84	2·08	—
Sixth    "   . . . . .	3·04	2·48	2·64	3·04	—
Seventh   "   . . . . .	·88	·88	1·04	1·04	—
Eighth   "   . . . . .	1·6	1·6	1·6	1·68	—
Ninth    "   . . . . .	2·0	1·92	1·76	1·76	—

*Remarks.*—Following the example of Mr. Hodgson, I have included under this name a number of specimens showing marked divergences in the relative lengths of the proboscis and of the legs. The species appears to be the commonest of the genus in the Ross Sea area.

*Colossendeis wilsoni*, sp. n. (Text-fig. 2).

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 1 ♀ (Holotype).

*Description.*—*Trunk* very compact; its greatest width, across the first pair of lateral processes, little less than its length; lateral processes in contact except for a slit-like interval between the third and fourth pairs. Ocular tubercle very broad, transversely oval as seen from above, bluntly rounded; eyes dark, anterior pair (or at least their pigmented area) much larger than the posterior. On dorsal surface behind ocular tubercle is a strongly convex area defined posteriorly by a crescentic groove.

*Proboscis* decurved, a little longer than trunk, sub-cylindrical, slightly dilated about the middle and again at the tip.

*Abdomen* decurved, slightly dilated distally, bluntly rounded at the tip.

*Palp* consisting of eight segments only; second segment less than one and a half times as long as fourth; sixth a little longer than fifth or seventh, and about one and a half times as long as thick; eighth about two-thirds as long as seventh.

*Oviger* stout; fourth segment a little longer than sixth; spines (very much worn) set in about five rows; terminal claw rather long.

*Legs* short and stout, third pair not quite seven times as long as trunk. Femur not quite four times as long as its greatest diameter, slightly shorter than first tibia,

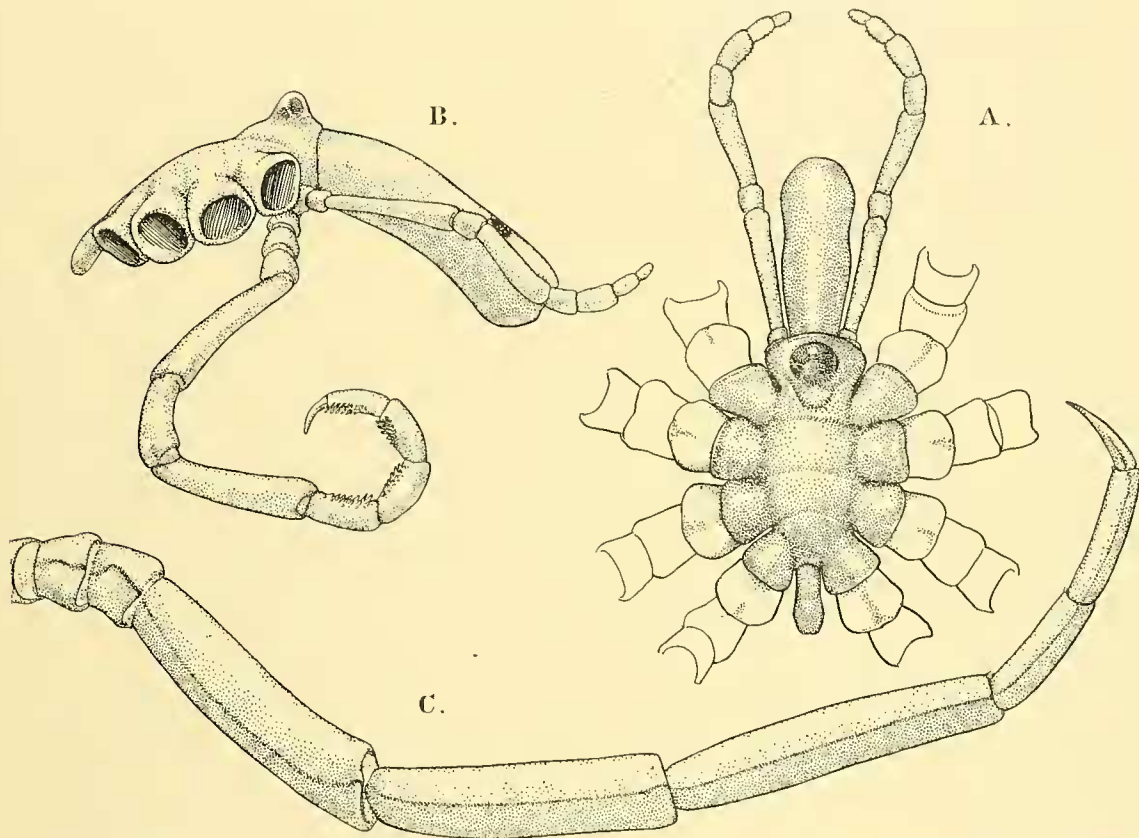


FIG. 2.—*Colossendeis wilsoni*, sp. n., Female. A. Dorsal view of body with palps and coxae. B. Lateral view of body with palp and oviger. C. Third leg of right side.

which, again, is shorter than second. Tarsus a little shorter than propodus; claw stout and curved, about two-thirds as long as propodus.

Body and limbs very smooth and free from conspicuous setae.

*Measurements, in mm.*—

	Holotype.
Length of proboscis . . . . .	6.56
Greatest diameter of proboscis . . . . .	1.84
Length of trunk . . . . .	5.28
Width across first lateral processes . . . . .	4.96
Length of abdomen . . . . .	2.08

Third right leg (distal segments from fourth)—		Holotype.
Coxæ	. . . . .	3·75
Femur	. . . . .	6·8
First tibia	. . . . .	7·2
Second tibia	. . . . .	8·56
Tarsus	. . . . .	2·8
Propodus	. . . . .	3·2
Claw	. . . . .	2·08
Palp—		
Second segment	. . . . .	2·96
Third	„ . . . . .	·64
Fourth	„ . . . . .	2·08
Fifth	„ . . . . .	·8
Sixth	„ . . . . .	·96
Seventh	„ . . . . .	·72
Eighth	„ . . . . .	·48

*Remarks.*—The most noteworthy character of the specimen described above is the presence of only eight segments in the palp, as compared with the nine that are present in the other species of the genus. The condition of the palps in some specimens of *C. lilliei*, described below, suggests the possibility that the reduction may be the result of regeneration after injury, but the complete symmetry of the two palps in the present specimen is against this supposition. The relation of the species to Hodgson's "*Notoendeis*" has already been alluded to. Apart from the character of the palps, the species is sufficiently distinguished from all other species of the genus by the characters given in the key.

The species is named in memory of Dr. E. A. Wilson, the chief of the scientific staff of the expedition.

*Colossendeis glacialis*, Hodgson.

*C. glacialis*, Hodgson, 1907, p. 61, Pl. ix, fig. 2, Pl. x, figs. 3 and 4.

*C. gracilipes*, Bouvier, 1911, p. 1137; *id.*, 1913, p. 58, figs. 12–19.

*Occurrence.*—Station 194, off Oates Land, 180–200 fathoms; 1 ♂. Station 294, Ross Sea, 158 fathoms; 1 ♂. Station 314, McMurdo Sound, 222–241 fathoms; 1 ♂. Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♀, 1 yg. Station 355, McMurdo Sound, 300 fathoms; 1 ♂.

*Measurements, in mm.*—

	"Terra Nova."		"Discovery." Holotype.
	Stn. 194.	Stn. 338.	
Length of proboscis.	♂ 10·0	♀ 11·75	♀ 8·75
Greatest diameter of proboscis	2·5	2·5	2·0
Length of trunk	12·0	14·0	10·0

	"Terra Nova."		"Discovery."
	Stn. 194.	Stn. 338.	Holotype.
Width between first and second lateral processes . . . . .	♂ 2·25	♀ 3·0	♀ 2·25
Width across second lateral processes . . . . .	7·3	8·5	6·0
Length of abdomen . . . . .	3·25	3·75	2·75
Third right leg—			
Coxæ . . . . .	6·5	7·25	6·0
Femur . . . . .	26·0	33·0	21·0
First tibia . . . . .	24·5	31·0	left 22·0 21·5
Second tibia . . . . .	22·5	29·0	left 20·0 16·0
Tarsus . . . . .	9·2	11·0	7·0
Propodus . . . . .	5·75	6·0	4·75
Claw. . . . .	3·75	—	2·5
Palp—			
Second segment . . . . .	6·0	—	4·2
Third    " . . . . .	·96	—	·68
Fourth   " . . . . .	4·4	—	2·88
Fifth    " . . . . .	1·68	—	1·12
Sixth    " . . . . .	2·08	—	1·6
Seventh  " . . . . .	1·6	—	1·12
Eighth  " . . . . .	1·44	—	1·12
Ninth   " . . . . .	1·6	—	1·12

*Remarks.*—According to the original description of this species the femur should be slightly shorter than the first tibia. This, however, is not always the case; even in a specimen labelled by Mr. Hodgson as "type," and here selected as holotype, the femur is a little longer than the tibia in the left leg, although shorter than it in the right leg of the third pair (see measurements above).

The smaller of the specimens in the "Terra Nova" collection do not differ in any important respect from the holotype. In particular, they agree with it in having only a median row of minute setæ on the dorsal surface of the trunk. The two largest specimens, however, of which measurements are given above, have the whole dorsal surface rough with short setæ and the legs rather more spiny. The general agreement in other respects leads me to regard these as only a spinose form of *C. glacialis*. The great length of the legs in the female from Station 338 is noteworthy.

It seems very likely that Bouvier's *C. gracilipes* will prove to be identical with this species. Almost the only definite characters in which they appear to diverge, according to Bouvier's account, are (1) the form of the proboscis, which in *C. gracilipes*

is much narrower at the base, and (2) the terminal segment of the palp, which is much longer than either of the two preceding it. It is to be noted that the terminal segment in *C. glacialis* is not, in reality, so short and globular as it is represented in Hodgson's figure.

*Colossendeis drakei*, sp. n. (Text-fig. 3).

*Occurrence*.—Station 294, Ross Sea, 158 fathoms; 1 ♀ (Holotype). Station 356, off Granite Harbour, 50 fathoms; 1 ♂.

*Description*.—*Trunk* elongated, its greatest width, across second pair of lateral processes, two-thirds of its length or a little less; second and third pairs of lateral

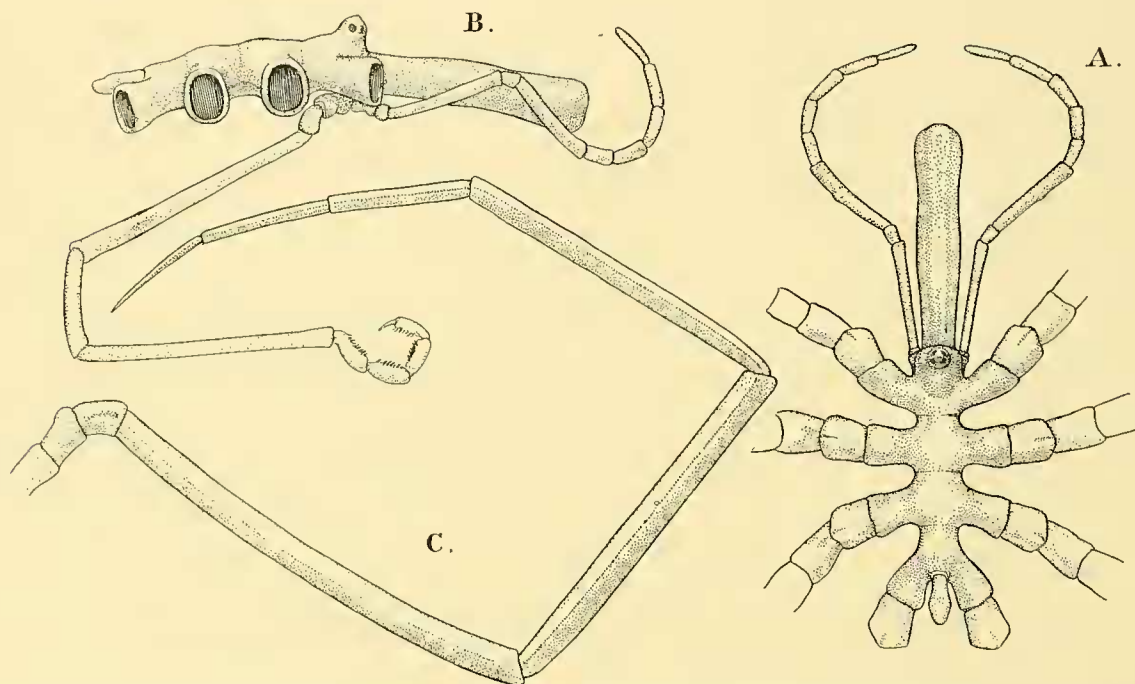


FIG. 3.—*Colossendeis drakei*, sp. n., Female. A. Dorsal view of body with palps and coxae. B. Lateral view of body with palp and oviger. C. Third leg of right side.

processes separated by a little less than their diameter; inter-segmental suture-lines fairly distinct in female, less so in male. Ocular tubercle rounded or very obtusely pointed, inclined forwards; eyes dark, anterior pair slightly the larger. No anterior tubercles on cephalon.

*Proboscis* straight, equal in length to trunk, proximal dilatation slightly marked, not quite so wide as the tip.

*Abdomen* short, hardly longer than maximum diameter of proboscis, dilated, with the sides obtusely angled about the middle so that it appears trapezoidal in outline from above.

*Palp* slender, second segment a little longer than fourth, the five distal segments

successively increasing in length, sixth about twice as long as thick; the surface almost devoid of setæ.

*Oviger* with fourth segment almost equal to sixth; distal segments with four rows of spines.

*Legs* slender, femur more than ten times as long as thick. Femur and first and second tibiæ successively decreasing in length. Tarsus and propodus subequal, claw little shorter than propodus.

Surface of body and limbs smooth, without conspicuous setæ or spinules.

*Measurements, in mm.*—

	(Holotype.)	
	♀	♂
Length of proboscis . . . . .	7·5	7·04
Greatest diameter of proboscis . . . . .	1·52	1·44
Length of trunk . . . . .	7·6	6·72
Width between second and third lateral processes . . . . .	1·44	1·36
Width across second lateral processes . . . . .	5·2	4·72
Length of abdomen . . . . .	1·84	1·6
Third right leg—		
Coxæ . . . . .	4·4	4·0
Femur . . . . .	16·1	12·6
First tibia . . . . .	13·25	11·0
Second tibia . . . . .	12·0	10·25
Tarsus . . . . .	5·2	4·48
Propodus . . . . .	4·96	4·32
Claw . . . . .	4·4	4·0
Palp—		
Second segment . . . . .	3·6	—
Third „ . . . . .	0·56	—
Fourth „ . . . . .	3·04	—
Fifth „ . . . . .	0·96	—
Sixth „ . . . . .	1·04	—
Seventh „ . . . . .	1·12	—
Eighth „ . . . . .	1·44	—
Ninth „ . . . . .	1·6	—

*Remarks.*—Among those of the longitarsal species that have the sixth segment of the palp not more than twice as long as thick, this species appears to be at once distinguishable by having the five distal segments of the palp successively increasing in length. The species is named after Staff-Paymaster Francis R. H. Drake, R.N., Secretary and Meteorologist on board the “Terra Nova,” who gave much help in the work of the biological staff.

*Colossendeis robusta*, Hoek.

*C. robusta*, Hoek, 1881, p. 66, Pl. ix, figs. 4 and 5; Möbius, 1902, p. 190, Pl. xxix, figs. 1-5; Bouvier, 1913, p. 54, text-figs. 8-11.

*Occurrence*.—Station 294, Ross Sea, 158 fathoms; 1 ♂, 1 immature.

*Measurements, in mm.*—

	"Terra Nova."	"Challenger."
	Stn. 294.	Holotype.
	♂	♀
Length of proboscis . . . . .	17·5	15·0
Greatest diameter of proboscis . . . . .	4·4	4·0
Length of trunk . . . . .	17·0	14·75
Width between second and third lateral processes	3·36	2·9
Width across second lateral processes . . . . .	11·2	9·2
Length of abdomen . . . . .	4·64	4·0
Third right leg -		
Coxæ . . . . .	11·25	9·25
Femur . . . . .	31·75	26·6
First tibia . . . . .	29·0	24·5
Second tibia . . . . .	31·75	27·75
Tarsus . . . . .	12·0	10·75
Propodus . . . . .	10·0	8·0
Claw . . . . .	7·3	4·0

*Remarks*.—Of the two specimens referred to this species, the one is a male and the other an immature specimen in which the genital openings are not yet patent. The former differs from the holotype in having (1) the second coxæ of all the legs a little more expanded distally and with more prominent dorsal tubercles, and (2) the claw much more than half the length of the propodus. In both of these characters our specimen agrees better with Bouvier's figures and description than with the holotype. On the other hand, the outline of the proboscis agrees very well with that of the holotype (not very accurately represented by Hoek's figure) and differs from Bouvier's figures in that the proximal dilatation is well beyond the middle of the length. The femur is exactly equal to the second tibia instead of being slightly shorter (holotype) or longer (Bouvier). It is to be noted that the measurements given by Bouvier as those of the holotype are taken from Hoek's figure, which, however, is enlarged two diameters; those given above are taken from the specimen itself.

A conspicuous, or at any rate very tangible, and perhaps important difference from the holotype consists in the presence of minute scattered spines on the proboscis (where they are set, not very regularly, in longitudinal rows) and on the dorsal surface of the legs; the surface of the body is smooth.

The immature specimen has the proboscis relatively more slender than in the adult.



*Colossendeis lilliei*, sp. n. (Text-fig. 4).

*Occurrence*.—Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♂, 2 ♀ (incl. Holotype).

*Description*.—*Trunk* compact, its greatest width, across second pair of lateral processes, more than two-thirds of its length; lateral processes separated by much less than their own diameter; intersegmental suture-lines well-marked. Ocular tubercle rather bluntly conical, broader than in *C. robusta*, occupying greater part of width of cephalon; eyes dark, sharply defined, anterior pair the larger. Tubercles near anterior border of cephalon less distinct and more laterally placed than in *C. robusta*.

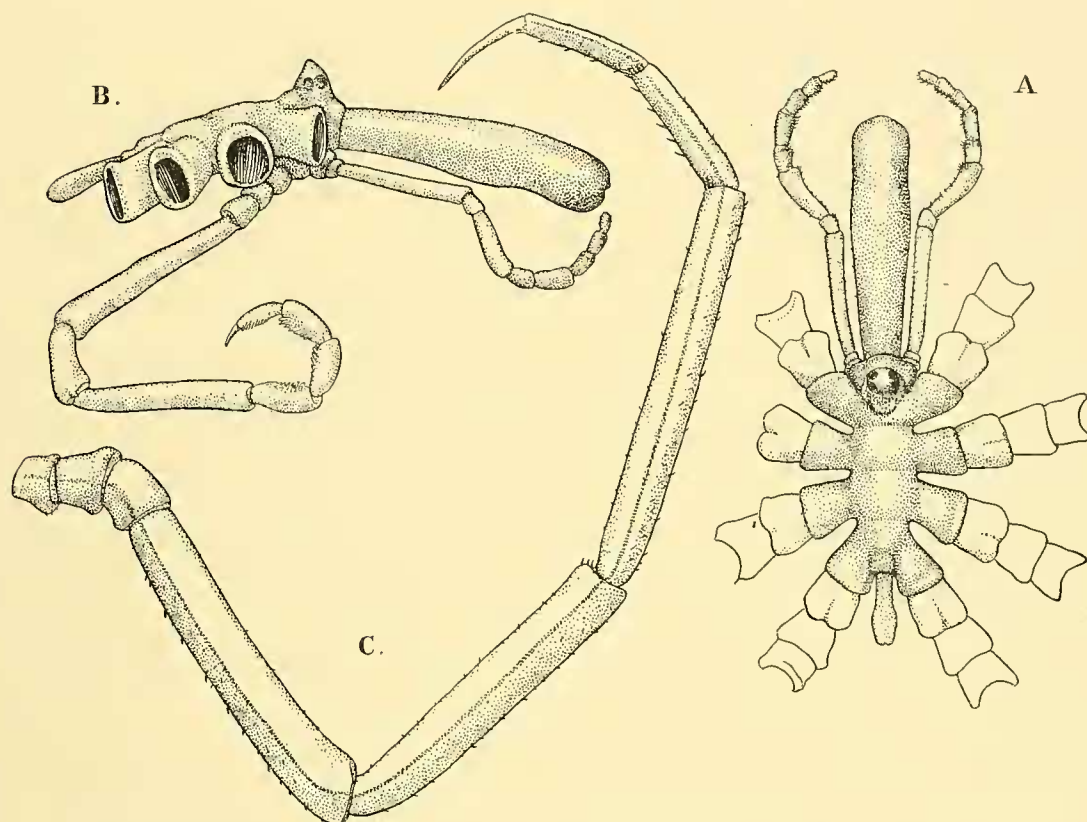


FIG. 4.—*Colossendeis lilliei*, sp. n., Female. A. Dorsal view of body with palps and coxae. B. Lateral view of body with palp and oviger. C. Third leg of right side.

*Proboscis* hardly decurved, distinctly longer than trunk, less narrowed at base than in *C. robusta*, with proximal dilatation less abrupt and the widest part hardly beyond middle.

*Abdomen* distinctly clavate, longer than maximum diameter of proboscis.

*Pulp* not differing greatly from that of *C. robusta* except that the terminal segment is much shorter than the preceding; distal segments minutely spinose.

*Oviger* resembling that of *C. robusta*; spines of distal segments (much worn in all the specimens) set, more or less regularly, in four rows.

*Legs* comparatively stout, greatest thickness of femur more than one-seventh of its length. Femur distinctly longer than first and shorter than second tibia. Tarsus subequal to propodus, claw more than three-fourths of length of latter.

Surface of trunk and proboscis smooth, legs rough with very minute spinules.

*Measurements, in mm.—*

	Holotype.		
	♀	♀	♂
Length of proboscis . . . . .	11·0	10·5	9·0
Greatest diameter of proboscis . . . . .	2·5	2·4	2·16
Length of trunk . . . . .	9·0	8·75	8·0
Width between second and third lateral processes . . . . .	2·64	2·96	2·25
Width across second lateral processes . . . . .	6·75	6·75	5·5
Length of abdomen . . . . .	3·5	3·0	2·8
Third right leg—			
Coxæ . . . . .	5·5	6·0	5·0
Femur . . . . .	14·0	14·0	12·0
First tibia . . . . .	13·5	13·75	11·5
Second tibia . . . . .	16·0	16·0	13·5
Tarsus . . . . .	5·75	5·44	4·32
Propodus . . . . .	5·25	5·28	4·48
Claw . . . . .	4·25	4·0	3·6
Palp—			
Second segment . . . . .	5·6	—	—
Third „ . . . . .	·8	—	—
Fourth „ . . . . .	2·96	—	—
Fifth „ . . . . .	1·12	—	—
Sixth „ . . . . .	1·52	—	—
Seventh „ . . . . .	1·2	—	—
Eighth „ . . . . .	1·2	—	—
Ninth „ . . . . .	·88	—	—

*Remarks.*—This species appears to differ from *C. robusta* chiefly in having the lateral processes much closer together, the proboscis longer than the trunk, and the femur distinctly shorter than the second tibia.

In two out of the three specimens the palp of one side is imperfectly formed, the terminal segment being minute and fused with the penultimate. It is possible that in these cases the terminal segment is in process of regeneration after removal by accident, but, if so, the rarity of similar cases in other species lacks explanation.\*

\* Vanhöffen (1914, p. 580) mentions a deformation of the palp of *Ammonothea glacialis*, Hodgson, due to the presence of a parasitic Isopod, *Coulmannia frigida*, Hodgson.

The species is named after Mr. D. G. Lillie, who was biologist in charge of the dredging and other work on board the "Terra Nova," to whom much credit is due for the extent of the collections brought home and their excellent condition.

GENUS PENTANYMPHON, Hodgson.

*Pentanympyon antarcticum*, Hodgson.

*P. antarcticum*, Hodgson, 1904, p. 459, Pl. xiv; *id.*, 1907, p. 36, Pl. v; *id.*, 1908, p. 177; Bouvier, 1907, p. 30, text-figs. 3-6; *id.*, 1913, p. 66, text-figs. 22-24.

*Occurrence*.—Station 220, off Cape Adare, 45-50 fathoms; 1 specimen. Station 318, McMurdo Sound, 130 metres; 1 specimen. Station 331, Entrance to McMurdo Sound, 250 fathoms; 1 specimen. Station 338, Entrance to McMurdo Sound, 207 fathoms; 12 specimens. Station 340, off Granite Harbour, 160 fathoms; 3 specimens. Station 355, McMurdo Sound, 300 fathoms; 1 specimen. Station 356, off Granite Harbour, 50 fathoms; 18 specimens.

*Measurements, in mm.*—

"Discovery," 30/3/03.

	Syntype. ♂ ovig.
Length of proboscis . . . . .	2·2
Diameter of proboscis . . . . .	·64
Length of trunk . . . . .	6·64
Length of cephalic segment . . . . .	2·72
Greatest width of cephalon . . . . .	1·08
Width of neck . . . . .	·4
Width between first and second lateral processes . . . . .	·5
Width across second lateral processes . . . . .	3·52
Third right leg—	
First coxa . . . . .	·92
Second coxa . . . . .	2·4
Third coxa . . . . .	1·0
Femur . . . . .	6·0
First tibia . . . . .	6·48
Second tibia . . . . .	9·92
Tarsus . . . . .	1·8
Propodus . . . . .	1·44
Claw . . . . .	·68
Auxiliaries . . . . .	·17
Palp—	
Second segment. . . . .	1·43
Third     " . . . . .	·95
Fourth   " . . . . .	·50
Fifth     " . . . . .	·67

*Remarks.*—Prof. Bouvier, taking his measurements apparently from Mr. Hodgson's figures, concludes that the "Discovery" specimens differ from those of the "Français" and "Pourquoi Pas?" in the greater relative thickness of the neck and in some other characters of less importance; and he suggests, tentatively, that the species may be divided into two geographical races, the "forme laticolle" inhabiting the Australian province, and the "forme angusticolle" the Magellanic province of the Antarctic region. In the former the ratio between the width of the cephalon anteriorly and that of the neck is represented by the number 1.56, while in the latter it varies from 2.5 to 3.0. The actual specimens from which Mr. Hodgson's figures were drawn cannot now be identified, but it is very unlikely that the accuracy of the figures themselves is so great as Prof. Bouvier assumes it to be. In half a dozen specimens taken at random from among the syntypes of the species, I find the ratio to vary between 2.55 and 2.77, while a close scrutiny, without actual measurement, of the remaining syntypes as well as of the material obtained by the "Terra Nova" failed to reveal any conspicuously thick-necked individuals such as would correspond to a ratio of 1.56. It is, at all events, clear that the slender-necked form is by no means restricted to the Magellanic province, while the thick-necked form, if it exists at all, is in no way characteristic of the Australian province.

Both Hodgson and Bouvier comment on the difficulty or impossibility of perceiving the genital pores in many specimens of the male sex. This is the case also with most of the specimens that I assume to be males in the present collection, but in several ovigerous specimens they are visible on the legs of the last three pairs, as Hodgson states. Bouvier makes the very probable suggestion (previously made by Hoek in the case of *Boreonymphon robustum*) that the pores only appear at the breeding period. In the ovigerous males and in some others which, from their size, are probably approaching maturity, the ventral surface of the femur bears a series of about ten low, truncated tubercles, bearing the openings of the femoral glands.

In one specimen more transparent than the rest (perhaps from a recent moult) the general arrangement of the nervous system can be made out. There are six large ganglia in the ventral chain, each of them lying within the limits of the somite innervated by it, with the exception of the last, which is moved forwards into the penultimate somite.

#### GENUS NYMPHON, Fabricius.

Although several writers (e.g., Meinert, 1899, p. 34) have commented on the indefinite character of the genus *Chaetonymphon*, Sars, it is still retained as a valid genus by Prof. Bouvier in his latest memoir (1913, p. 94). I am encouraged to depart from this precedent, however, by the fact that Prof. Bouvier himself seems to have been misled by it, and to have described as a new species of *Nymphon* a form that had already been twice named and described in the genus *Chaetonymphon* (see below, *N. australe*).

*Nymphon charcoti*, Bouvier.

*N. charcoti*, Bouvier, 1911, p. 1138; *id.*, 1913, p. 81, text-figs. 32-34.

*Occurrence*.—Station 294, Ross Sea, 158 fathoms; 2 ♀, 1 ♂. Station 349, McMurdo Sound, 80 fathoms; 1 ♀.

*Measurements, in mm.*—

	Station 349.
	♀
Length of proboscis . . . . .	8·5
Diameter of proboscis . . . . .	2·56
Length of trunk . . . . .	16·5
Length of cephalic segment . . . . .	8·0
Greatest width of cephalon . . . . .	4·12
Width of neck . . . . .	1·48
Diameter of ocular tubercle . . . . .	1·0
Width between first and second lateral processes . . . . .	1·88
Width across second lateral processes . . . . .	11·0
Third right leg—	
First coxa . . . . .	4·0
Second coxa . . . . .	9·0
Third coxa . . . . .	3·5
Femur . . . . .	23·0
First tibia . . . . .	24·0
Second tibia . . . . .	32·0
Tarsus . . . . .	8·5
Propodus . . . . .	5·5
Claw . . . . .	4·5
Palp—	
Second segment . . . . .	4·5
Third     ,, . . . . .	5·0
Fourth    ,, . . . . .	4·5
Fifth     ,, . . . . .	5·5

*Remarks*.—Our largest specimen, of which measurements are given above, considerably exceeds the maximum dimensions given by Bouvier, and shows that the species takes a place among the largest of the genus. Its limbs are much less setose than those of the male figured by Bouvier, but the other two females, as well as the male, have the setæ even longer and more numerous than in his figure. The male has the femora considerably less dilated than in Bouvier's specimen, not differing in this respect from the females. The claws of the legs are in no case conspicuously longer than the propodus, and in the specimen measured they are distinctly shorter. In all other respects the specimens agree very well with Bouvier's account, and confirm his opinion that the differences between his specimens were not of specific value.

*Nymphon gracillimum*, sp. n. (Text-fig. 5).

*Occurrence*.—Station 314, McMurdo Sound, 222–241 fathoms; 1 ♂ (Holotype).

*Description*.—*Trunk* elongated and slender, the lateral processes separated by more than their own diameter. Cephalic segment nearly as long as remaining segments together. Neck long and slender, less than half as wide as anterior dilatation of cephalon. Ocular tubercle broad, low, and rounded; ocular pigment abundant and dark.

*Proboscis* cylindrical, slightly decurved, rather pointed at the tip as seen from above, shorter than cephalic segment.

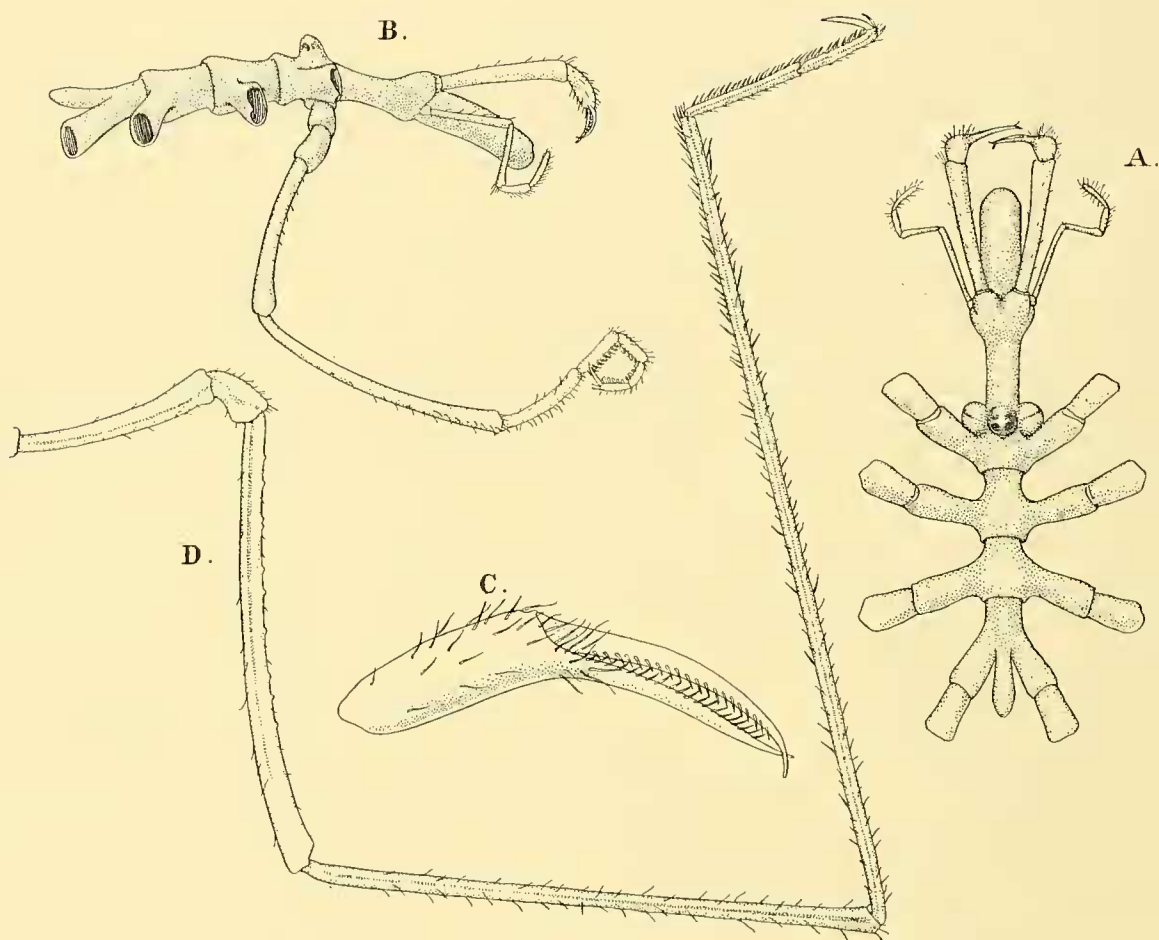


FIG. 5.—*Nymphon gracillimum*, sp. n., Male. A. Dorsal view of body with chelophores, palps, and first coxae. B. Lateral view of body with chelophore, palp, and oviger. C. Chela, further enlarged. D. Third leg of right side.

*Abdomen* elevated, slightly clavate, and more than twice as long as wide.

*Chelophore* with scape longer than proboscis and six times as long as wide. Chela shorter than scape, fingers about one-third longer than palm.

*Palp* fairly slender, third segment three-fourths as long as second, fourth half as long as third and shorter than fifth.

*Oviger* long and slender, fourth segment two-thirds of length of fifth.

*Legs* very long and slender, rather sparsely set with spinous setæ, which become more numerous distally and only here and there exceed in length the diameter of the segment bearing them. Second coxa much longer than the other two together. Femur more than one and a half times as long as the three coxæ together, at least sixteen times as long as its greatest diameter, with a row of about ten gland-tubercles on its ventral edge. Second tibia about half as long again as the first and not much less than twice as long as the femur. Tarsus longer by about one-third than the propodus, the two together measuring about one-fourth of the second tibia. Main claw more than half as long as propodus and three times as long as auxiliary claws.

*Measurements, in mm.—*

	(Holotype.)
Length of proboscis . . . . .	1·92
Diameter of proboscis . . . . .	·56
Length of trunk . . . . .	4·8
Length of cephalic segment . . . . .	2·3
Greatest width of cephalon . . . . .	·92
Width of neck . . . . .	·4
Width between first and second lateral processes . . . . .	·48
Width across second lateral processes . . . . .	2·48
Third right leg—	
First coxa . . . . .	·92
Second coxa . . . . .	2·8
Third coxa . . . . .	·8
Femur . . . . .	6·4
First tibia . . . . .	8·16
Second tibia . . . . .	12·0
Tarsus . . . . .	1·6
Propodus . . . . .	1·2
Claw . . . . .	·64
Auxiliaries . . . . .	·2
Palp—	
Second segment . . . . .	1·15
Third     ,, . . . . .	·85
Fourth    ,, . . . . .	·4
Fifth     ,, . . . . .	·58

*Remarks.*—This species is closely related to *N. gracilipes*, Miers, the characters and synonymy of which I have recently discussed elsewhere (1915*b*). In view of the considerable range of variation shown by the forms included under that name, it is

possible that they may prove to be united by intermediate gradations with the species now described. For the present, however, the latter appears to be sufficiently distinguished by its greater slenderness, especially of the chelophores and legs, the relative shortness of the fourth and fifth segments of the palp, the greater length of the second tibia, and the fact that the claw is more than half as long as the propodus.

*Nymphon hiemale*, Hodgson.

*N. hiemale*, Hodgson, 1907, p. 20, Pl. iii, fig. 1, Pl. x, fig. 8.

*Occurrence*.—Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♀.

*Measurements, in mm.*—

	"Discovery." Holotype. ♀
Length of proboscis . . . . .	3·32
Diameter of proboscis . . . . .	1·04
Length of trunk . . . . .	6·64
Length of cephalic segment . . . . .	2·96
Greatest width of cephalon . . . . .	1·52
Width of neck . . . . .	·56
Width between first and second lateral processes . . . . .	·68
Width across second lateral processes . . . . .	3·76
Leg—	
First coxa . . . . .	1·28
Second coxa . . . . .	2·96
Third coxa . . . . .	1·36
Femur . . . . .	9·6
First tibia . . . . .	10·4
Second tibia . . . . .	15·7
Tarsus . . . . .	2·24
Propodus . . . . .	2·16
Claw . . . . .	·88
Auxiliaries . . . . .	·3
Palp—	
Second segment . . . . .	1·64
Third ,, . . . . .	1·44
Fourth ,, . . . . .	·75
Fifth ,, . . . . .	1·1

*Remarks*.—The specimen obtained by the "Terra Nova" resembles very closely those got by the "Discovery." The measurements given above are taken from one of the latter labelled by Mr. Hodgson as the type.

Bouvier's key to the Antarctic species of *Nymphon* brings this species into



proximity with *N. meridionale*, Hoek, which I have regarded as a synonym of *N. gracilipes*, Miers. *N. hiemale* is, however, a much larger species, and differs in certain proportions of the body and limbs, as shown by the measurements given above. The greater length of the proboscis and shortness of the cephalic segment are noteworthy. There is also a characteristic difference in the fingers of the chelæ, which are much straighter, meeting along their length when closed. In *N. gracilipes* the movable finger is strongly arched, and the fingers gape widely even when the points cross for some distance.

*Nymphon adareanum*, Hodgson.

*N. adareanum*, Hodgson, 1907, p. 23, Pl. iii, fig. 3.

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 12 specimens.

*Measurements, in mm.*—

	“Discovery.” Holotype.
	♂
Length of proboscis . . . . .	.65
Diameter of proboscis at base . . . . .	.5
Length of trunk . . . . .	1.75
Length of cephalic segment . . . . .	.85
Greatest width of cephalon . . . . .	.68
Width of neck . . . . .	.34
Length of abdomen . . . . .	.65
Third right leg—	
First coxa . . . . .	.4
Second coxa . . . . .	.9
Third coxa . . . . .	.45
Femur . . . . .	2.05
First tibia . . . . .	2.15
Second tibia . . . . .	3.0
Tarsus . . . . .	.3
Propodus . . . . .	1.05
Claw . . . . .	.5
Auxiliaries . . . . .	.33
Palp—	“Terra Nova.”
	♀
Second segment. . . . .	.34
Third     “ . . . . .	.30
Fourth     “ . . . . .	.12
Fifth     “ . . . . .	.18

*Remarks*.—The “Terra Nova” specimens agree very closely with the holotype. The proportions of the palpal segments are incorrectly given by Hodgson. Those of

the remaining palp of the holotype, which could not be measured without removal, do not differ perceptibly from those of a "Terra Nova" specimen of which the measurements are given above. The very small number and the simple form of the special spines on the ovigers are, as Hodgson has pointed out, unusual characters of this species. In a male from the "Terra Nova" collection the numbers of spines on the last four segments of the oviger are 2 : 1 : 1 : 1.

*Nymphon proximum*, sp. n. (Text-fig. 6).

*Occurrence*.—Station 295, Ross Sea, 190 fathoms; 1 ♂ (Holotype).

*Description*.—*Trunk* compact, all the lateral processes in contact, at least at the base, first two intersegmental articulations distinct, no neck. Width of cephalon a

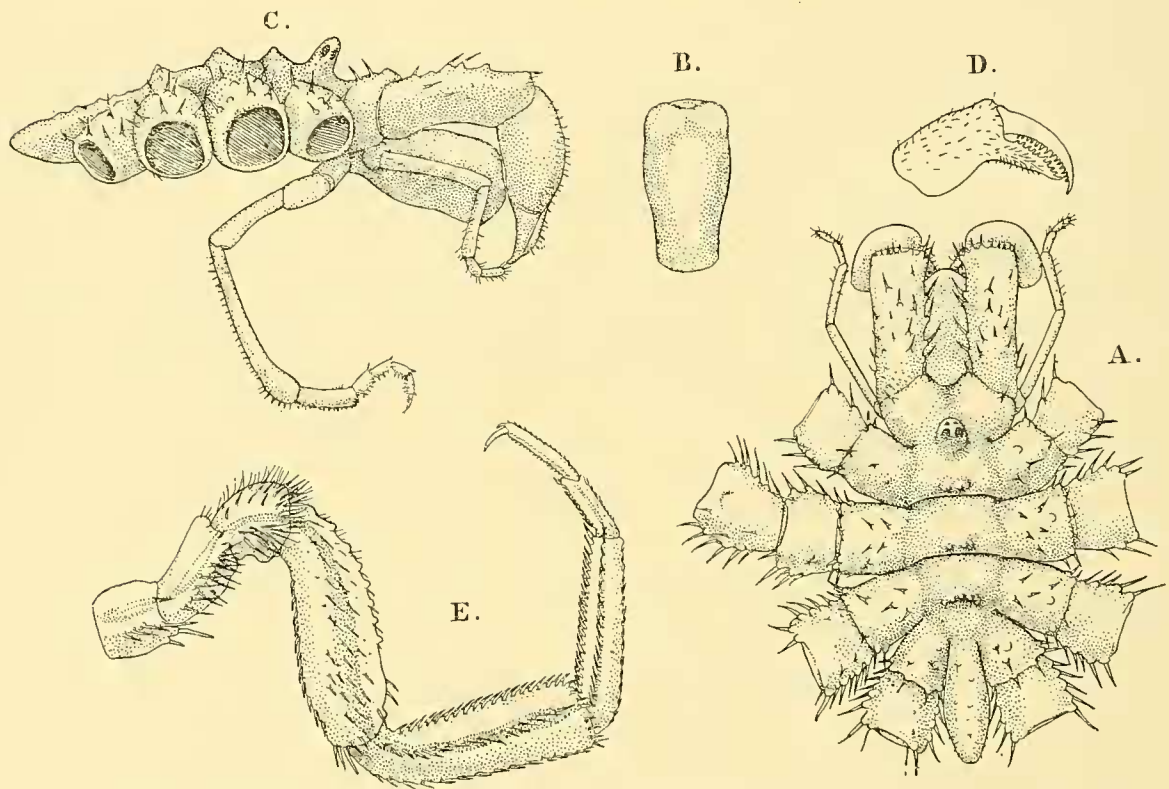


FIG. 6.—*Nymphon proximum*, sp. n., Male. A. Dorsal view of body with chelophores, palps, and coxæ. B. Ventral view of proboscis. C. Lateral view of body with chelophore, palp, and oviger. D. Chela, further enlarged. E. Third leg of right side.

little more than half length of trunk, greatest width of trunk across second lateral processes four-fifths of its length. Ocular tubercle about as high as it is wide, somewhat compressed antero-posteriorly, inclined forwards. A pair of stout setæ on a tubercle in middle of each of first three leg-bearing somites dorsally, and a number of short stout setæ on each of lateral processes.

*Proboscis* very stout, expanding from base for less than half its length, then cylindrical.

*Abdomen* horizontal, fusiform, about two-fifths of length of trunk.

*Chelophore* stout, scape armed above, and especially on inner face, with strong spiniform setæ. Chela with palm less than twice as long as wide, much longer than immovable finger, which forms an angle of roughly 120° with its inner edge. Immobile finger with setose pad extending for two-thirds of its length and with nine teeth on inner edge.

*Palp* with second segment longer by one-half than third, which is about three times as long as fourth or fifth.

*Legs* very stout but tapering rapidly from end of first tibia. Femur equal to first tibia and longer by one-fourth than second. Tarsus shorter than propodus, which is less than three times as long as claw; auxiliary claws not more than one-fourth of length of main claw. Legs beset with stout roughened spines much shorter than the diameter of the segments carrying them; on the tibiæ the spines are closely set in two dorsal, two lateral, and one ventral row. On ventral edge of femur is a row of about seven gland-tubercles.

*Measurements, in mm.—*

	<i>N. proximum.</i> Holotype.	<i>N. villosum.</i> Holotype.
Length of proboscis . . . . .	3·0	3·04
Diameter of proboscis . . . . .	1·65	1·52
Length of trunk . . . . .	5·0	4·2
Width of cephalon . . . . .	2·75	2·8
Width across second lateral processes . . . . .	4·2	4·0
Length of abdomen . . . . .	2·1	2·0
Third right leg—		
Coxæ (together) . . . . .	3·4	3·4
Femur . . . . .	3·5	3·6
First tibia . . . . .	3·5	4·0
Second tibia . . . . .	2·8	3·8
Tarsus . . . . .	1·2	1·4
Propodus . . . . .	1·4	1·6
Claw . . . . .	·5	·68
Palp—		
Second segment . . . . .	1·8	1·72
Third „ . . . . .	1·2	1·36
Fourth „ . . . . .	·38	·46
Fifth „ . . . . .	·38	·7

*Remarks.*—This species approximates in many of its characters to *Chaetonymphon villosum*, Hodgson, but differs conspicuously from it in having the covering of long hairs replaced by short stout spines. It further differs in the proportions of various

parts, the fingers of the chelæ being much shorter than in that species, the femur equal to the first tibia and longer than the second, the second segment of the palp relatively a little longer, and the last two segments of equal length. In *Ch. villosum* also the proboscis is not contracted at the base.

*Nymphon biarticulatum* (Hodgson)?

*Chætonymphon biarticulatum*, Hodgson, 1907, p. 28, Pl. iv, fig. 2, Pl. x, fig. 12.

*Occurrence*.—Station 314, McMurdo Sound, 222–241 fathoms; 1 ♀.

*Remarks*.—The single specimen agrees in many characters with the holotype of Hodgson's species, but differs in the more compact body, the shorter and stouter legs clothed with shorter setæ, the much less elevated ocular tubercle, and in a number of other minor points. It is quite possible that it may represent a distinct species, but as it is solitary and far from perfect, no good purpose would be served by a more detailed but necessarily incomplete description.

*Nymphon mendosum* (Hodgson).

*Chætonymphon mendosum*, Hodgson, 1907, p. 30, Pl. iv, fig. 3, Pl. x, fig. 13.

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 3 specimens. Station 314, McMurdo Sound, 222–241 fathoms; 11 specimens. Station 318, McMurdo Sound, 130 metres; 1 specimen. Station 321, McMurdo Sound, 169 fathoms; 3 specimens. Station 338, Entrance to McMurdo Sound, 207 fathoms; 3 specimens. Station 340, off Granite Harbour, 160 fathoms; 13 specimens. Station 355, McMurdo Sound, 300 fathoms; 1 specimen. Station 356, off Granite Harbour, 50 fathoms; 7 specimens.

*Remarks*.—The form of the chelæ in this and some allied species appears to afford diagnostic characters to which sufficient attention has not yet been drawn. In *N. mendosum* the immovable finger lies nearly at right angles to the palm, the setose cushion on its lower edge occupies more than half its length, the movable finger extends beyond it for a considerable distance, and the teeth of both fingers are widely spaced. In the closely allied *N. biarticulatum* the immovable finger forms a very oblique angle with the palm, the setose pad extends for less than half its length, the overlap of the movable finger is less extensive, and the teeth are more closely set. *N. villosum*, again, is in most of these characters intermediate between the two.

*Nymphon australe*, Hodgson.\*

*N. australe*, Hodgson, 1902, p. 257, Pl. xl.

*Chætonymphon altiocolatum*, Möbius, 1902, p. 181, Pl. xxvi, figs. 1–6.

*Chætonymphon australe*, Hodgson, 1907, p. 32, Pl. x, fig. 14.

*Ch. australe*-var. *austrinorum*, Hodgson, f.c. p. 35, Pl. iv, fig. 4, Pl. x, fig. 15.

*Nymphon stylops*, Bouvier, 1911, p. 1137; *id.*, 1913, p. 73, text-figs. 25–31.

\* The assumption that Hodgson's name has priority over that given by Möbius in the same year depends on the fact that the records of this Museum show the distribution of the "Southern Cross" Report to have been begun on 31st May, 1902, while Möbius' Report on the "Valdivia" Pycnogonida was not received by our Library until 30th December, 1902.

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 4 specimens. Station 294, Ross Sea, 158 fathoms; 3 specimens. Station 314, McMurdo Sound, 222–241 fathoms; 3 specimens. Station 338, Entrance to McMurdo Sound, 207 fathoms; 200 specimens. Station 340, off Granite Harbour, 160 fathoms; 20 specimens. Station 356, off Granite Harbour, 50 fathoms; 11 specimens.

*Measurements, in mm.*—

	“Southern Cross.”	“Dis- covery.”	“Terra Nova.”	
	Holotype. ♀ <sup>1</sup>	♀ <sup>2</sup>	Stn. 220. ♂ <sup>3</sup> (ovig.)	Stn. 340. ♂ <sup>4</sup> (ovig.)
Length of proboscis . . . . .	2·64	3·2	2·56	3·52
Diameter of proboscis . . . . .	1·2	1·12	1·12	1·36
Length of trunk . . . . .	4·4	5·84	4·88	6·8
Length of cephalic segment . . . . .	2·2	2·5	2·25	3·2
Greatest width of cephalon . . . . .	1·92	1·6	1·76	2·4
Height of ocular peduncle . . . . .	·8 (?)	1·28	1·12	1·36
Width between first and second lateral processes	1·12	·96	1·04	1·2
Width across second lateral processes . . . . .	3·08	4·0	3·2	5·36
Third leg (right or left)—				
Coxæ (together) . . . . .	3·6	4·4	3·68	6·4
Femur . . . . .	3·6	5·36	3·6	6·64
First tibia . . . . .	4·4	7·04	4·8	9·6
Second tibia . . . . .	4·16	6·56	4·4	8·64
Tarsus . . . . .	2·0	2·8	2·08	3·6
Propodus . . . . .	1·6	2·08	1·6	2·4
Claw . . . . .	·64	·88	·64	·96

<sup>1</sup> One of two specimens (♂ ♀) in tube labelled “figured specimens,” here selected as Holotype.

<sup>2</sup> Syntype of var. *austrinorum*.

<sup>3</sup> Specimen approaching typical form.

<sup>4</sup> Specimen approaching var. *austrinorum*. See remarks below.

*Remarks.*—The great majority of the specimens obtained by the “Terra Nova” agree closely with the “Discovery” specimens that form the types of the variety *austrinorum*. There are, however, a number that, in their smaller size, longer legs, and more strongly built and hairier bodies, approach the typical form of the species without its being possible to separate them definitely from the others. I am not prepared to express an opinion as to the status of the variety *austrinorum*, but it may not be without significance that, of all the “Terra Nova” specimens, those that approach most nearly to the typical *australe*-form are the four obtained at Station 220, off Cape Adare, the type-locality for the species.

Bouvier’s *Nymphon stylops* appears to differ in no essential feature, as far as his description and figures go, from the typical form of this species.

## GENUS AUSTROPALLENE, Hodgson.

Hodgson (1915, p. 144) has recently proposed this genus for the reception of those Antarctic species hitherto referred to *Pseudopallene* or to *Cordylochele*, which have a pair of spurs on the cephalon over the bases of the chelophores, and no terminal claw on the ovigers. Neither character is quite satisfactory, for the northern species of *Phorichilus* (= *Pseudopallene*) have a group of conical tubercles in place of the cephalic spurs, and one of these tubercles may be larger than the others; while in *Austropallene* there is usually, perhaps always, a minute terminal spine, if not a "claw," on the oviger.

*Austropallene cornigera* (Möbius).

*Pseudopallene cornigera*, Möbius, 1902, p. 186, Pl. xxvii, figs. 14–20; Hodgson, 1907, p. 7, Pl. i, fig. 3; Bouvier, 1913, p. 97.

*Cordylochele turqueti*, Bouvier, 1905, p. 297; *id.*, 1907, p. 33, text-figs. 7–18 *bis*.

*Pseudopallene australis*, Hodgson, 1907, p. 10, Pl. i, fig. 2.

*Austropallene cornigera*, Hodgson, 1914–15, p. 144.

*Occurrence*.—Station 194, off Oates Land, 180–200 fathoms; 1 ♀, 1 ♂. Station 294, Ross Sea, 158 fathoms; 1 ♀. Station 314, McMurdo Sound, 222–241 fathoms; 6 ♀, 3 ♂, 3 immature. Station 338, Entrance to McMurdo Sound, 207 fathoms; 2 ♀. Station 355, McMurdo Sound, 300 fathoms; 1 ♀, 1 immature.

*Remarks*.—Differences of some importance exist between the specimens recorded under this name, without, however, affording ground for the recognition of more than one species. The relative length of the legs varies considerably, in some cases equalling that of the "Valdivia" specimens, and in others not exceeding the proportions recorded by Hodgson and by Bouvier. The following measurements (in mm.) are taken from specimens chosen as having nearly the same body-length:—

	Station 314.	Station 338.
	♀	♀
Length of trunk . . . . .	5.5	6.5
Third right leg—		
Total length . . . . .	25.5	38.0
Femur . . . . .	6.5	10.0
First tibia . . . . .	6.0	9.5
Second tibia . . . . .	6.75	10.5

Variations in the outline of the proboscis, the direction and length of the cephalic spurs, and the development of spurs on the lateral processes, all tend to confirm the synonymy given above, which combines the suggestions of Hodgson and of Bouvier. In all cases, however, the terminal lips of the proboscis are setose, not merely tuberculated as Bouvier found them.

*Austropallene brachyura* (Bouvier).

*Pseudopallene brachyura*, Bouvier, 1911, p. 1138; *id.*, 1913, p. 98, figs. 51–54.

*Austropallene spicata*, Hodgson, 1914–15, p. 144.

*Occurrence*.—Station 314, McMurdo Sound, 222–241 fathoms; 1 ♀. Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♀. Station 340, off Granite Harbour, 160 fathoms; 1 ♀, 1 immature.

*Remarks*.—The specimens differ from Bouvier's account of this species in the following points: The spurs on the lateral processes and first coxæ are distinctly longer; on each lateral process, in addition to the spurs, there is a small tubercle about the middle of the distal edge; and the second coxæ have, on the dorsal surface, two rows of tubercles, much more prominent than in Bouvier's figure, and some of them almost spiniform. Like the holotype, all our specimens are females, and although somewhat larger, their measurements show a close agreement in proportions. There can, I think, be little doubt that Hodgson's *Austropallene spicata* has been founded on the male sex of the same species. The two syntypes that I have examined are both males, and they agree very closely with the "Terra Nova" specimens except for a slightly greater slenderness of body and a marked increase in the relative length of the second coxæ.

*Austropallene tibicina*, sp. n. (Text-figs. 7 and 8).

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 3 ♀, 2 ♂ (incl. Holotype).

*Description*.—Resembling *A. brachyura* in general form, but more slender and with the spurs of the body and legs much larger.

*Cephalic segment* nearly half the total length of the trunk, anterior dilatation about two and a half times the diameter of the neck. Ocular tubercle low, obtuse, much smaller in diameter than the neck, eyes well-separated, reddish.

*Lateral processes* separated by intervals of at least their own diameter, the first with one, the others with a pair of large distal spurs, and each also with a small conical tubercle in the middle of the distal margin. The lateral processes and their spurs are more elongated in the male than in the female.

*Proboscis* contracted, about the middle of its length, to a slender, downwardly-curved tube, with a conspicuous brush of setæ on the three terminal lips.

*Abdomen* relatively a little larger than in *A. brachyura*, directed obliquely upwards.

*Chelophores* slender, the scape more (♂) or less (♀) than four times as long as thick, shorter than the proboscis. Chelæ not more than two-thirds the length of the scape, movable finger strongly arched, toothless, shorter than the palm, immovable finger extending far beyond it, curved only at the tip, with two blunt tubercles between which the tip of the immovable finger fits; both fingers sharply pointed.

*Oviger* of male with fifth segment twice as long as fourth, bearing a short lateral process at its distal end.

*Legs slender.* First coxa of each with a pair of lateral spurs which, at least in the male, exceed the diameter of the segment. Second coxa three (♀) or four (♂) times as

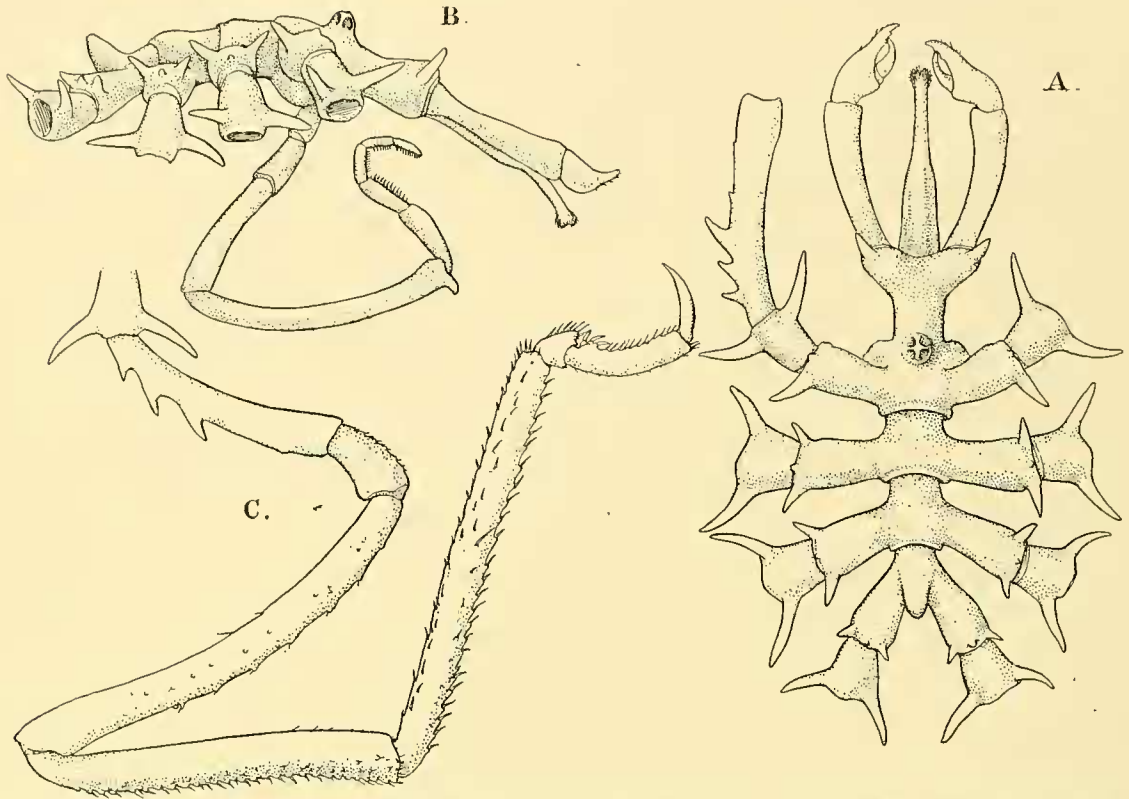


FIG. 7.—*Austropallene tibicina*, sp. n., Male. A. Dorsal view of body with chelophores and first and second coxae. B. Lateral view of body with chelophore and oviger. C. Third leg of right side.

long as the first and a little less or more than half as long as the femur, gently curved and dilating distally; on the dorsal surface are two rows of tubercles, those of the

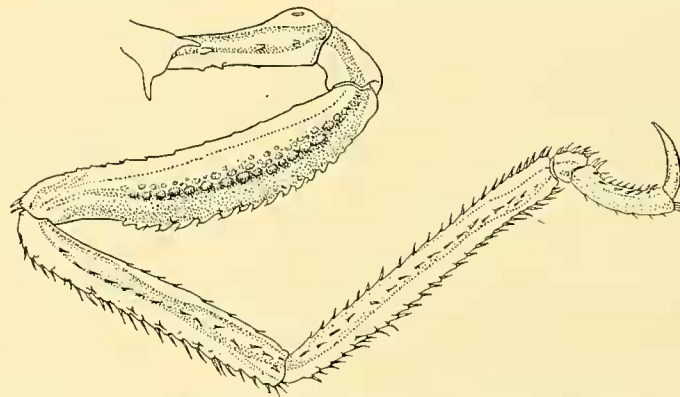


FIG. 8.—*Austropallene tibicina*, sp. n., Female. Third leg of right side.

posterior row the larger, and two or three of them in the male forming large spurs. Femur longer by one-fourth than the first tibia and subequal to the second.



Surface of body smooth, the legs spinous, especially the distal segments.

*Measurements, in mm.*—

	Holotype.	
	♂	♀
Length of proboscis . . . . .	1·68	1·44
Diameter of proboscis at base . . . . .	·36	·36
Diameter of proboscis near tip . . . . .	·12	·12
Length of cephalon . . . . .	·88	·76
Greatest width of cephalon . . . . .	1·00	·92
Width of neck . . . . .	·4	·38
Length of trunk . . . . .	2·6	2·16
Width between first and second lateral processes . . . . .	·44	·4
Width across second lateral processes . . . . .	2·08	1·44
Third right leg—		
First coxa . . . . .	·48	·44
Second coxa . . . . .	1·92	1·36
Third coxa . . . . .	·72	·48
Femur . . . . .	3·72	3·04
First tibia . . . . .	3·0	2·56
Second tibia . . . . .	3·6	2·88
Tarsus and propodus . . . . .	1·32	1·04
Claw . . . . .	·72	·64

*Remarks.*—This species is allied to *A. brachyura*, especially in the armature of spurs on the lateral processes and proximal segments of the limbs and in the shortness of the abdomen. It differs from that species, amongst other characters, in the form of the proboscis with its slender distal part and conspicuous apical brush, and in the long and sharply pointed immovable finger of the chela.

GENUS PALLENOPSIS, Wilson.

*Pallenopsis glabra*, Möbius.

*Pallenopsis glabra*, Möbius, 1902, p. 184, Pl. xxvii, figs. 1-6; Hodgson, 1907, p. 11; Bouvier, 1913, p. 109, figs. 62-65.

*P. hiemalis*, Hodgson, 1907, p. 17, Pl. i, fig. 4, Pl. ii, fig. 3.

*Occurrence.*—Station 314, McMurdo Sound, 222-241 fathoms; 1 ♀. Station 338, Entrance to McMurdo Sound, 207 fathoms; 5 ♀, 4 ♂, 1 immature. Station 355, McMurdo Sound, 300 fathoms; 1 ♀.

*Remarks.*—Except that they are a good deal larger and more spiny, the "Discovery" specimens referred by Hodgson to *P. glabra* do not seem to me to differ greatly from the types of his *P. hiemalis*. Most of the specimens obtained by the "Terra Nova" resemble very closely the types of *P. hiemalis*, but they show a good deal of variation in the development of spines or setæ on the body and limbs, although

none are quite so spiny as Hodgson's *P. glabra*. They also differ among themselves in the development of the rounded or irregular dorsal prominences on the lateral processes, in the sharpness of the distal corners of the first coxa, and in the extent and shape of the "spinous cushion" at the base of the movable finger of the chelophores. In some, this cushion is depressed and restricted to a small area at the very base of the finger, in others it occupies at least half of the length of the finger, and its distal end projects freely as a conical lobe as in Wilson's figure of the chela of *P. forficifer*. In all the females the femur is distinctly shorter than the second tibia, although the difference is less than in the males. Möbius and Bouvier agree that the femur is equal to the second tibia of the female in *P. glabra*.

At the distal ends of the femur and first tibia there are three small tubercles dorsally and an indistinct tubercle on each side below the lateral line. These tubercles vary in their degree of development, and can hardly be detected in the specimens referred by Hodgson to *P. glabra*; they correspond to the five processes that are found in this position in some or all of the species belonging to Loman's subgenus *Rigona*.

I am not at all confident that this species can be maintained as distinct from *Phoxichilidium patagonicum*, Hoek (1881, p. 84, Pl. xii, figs. 6-9). The only adult specimen among Hoek's syntypes is the female which he has figured. This differs considerably from all the specimens that I have referred to *P. glabra*. It has the lateral processes separated by less than half their own diameter at the base, the cephalon nearly parallel-sided as seen from above, with the ocular tubercle not occupying the whole of its width anteriorly; the chela is hardly widened distally, and its outer edge is straight; the propodus is about three times as long as wide, the main claw is less than half the length of the propodus, and the auxiliaries about half the length of the main claw. In adult specimens of *P. glabra* the lateral processes are separated at the base by a distance about equal to their own diameter, the cephalon narrows toward the front, where the base of the ocular tubercle occupies the whole of its width; the chela is widened distally, and its outer edge is concave; the propodus is about four times as long as wide, the main claw is usually more than half the length of the propodus, and the auxiliaries distinctly less than half the length of the main claw. When, however, the comparison is extended to the immature specimens of both forms, all these distinctions lose their sharpness; in particular, the immature specimen that Hoek described under the name *P. patagonicum* var. *elegans* (1881, p. 86, Pl. xii, fig. 10) appears to differ in no respect from specimens of *P. glabra* of similar size, except that the lateral processes are less than their own diameter apart, the main claws are a little shorter, and the auxiliaries a little longer.

*Pallenopsis pilosa* (Hoek).

*Phoxichilidium pilosum*, Hoek, 1881, p. 90, Pl. xiii, figs. 10-13.

*Pallenopsis pilosa*, Hoek, 1883, p. 9; Hodgson, 1907, p. 15, Pl. ii, fig. 2; Bouvier, 1913, p. 107, figs. 60 and 61.

*Occurrence*.—Station 294, Ross Sea, 158 fathoms ; 2 ♀, 1 ♂.

*Remarks*.—The specimens agree very closely indeed with those of the “Discovery” collection, referred to this species by Hodgson. While accepting this identification, I would point out that the specimens from the Ross Sea region agree with one another in certain characters, in which they differ from the two surviving syntypes of Hoek’s species.\* In the latter the body and limbs are distinctly more slender, the lateral processes separated by nearly their own diameter, the abdomen nearly equal to the first two segments together, the auxiliary claws less than one-fourth as long as the main claws, and the “under-fur” of minute setæ is everywhere conspicuous on the surface of the body and legs. The Ross Sea specimens are more robust, the lateral processes separated by not more than half their own diameter, the abdomen is about equal to (only in one specimen distinctly longer than) the cephalic segment, the auxiliary claws are about one-third as long as the main claws, the under-fur is much less conspicuous and less generally distributed.

*Pallenopsis vanhoeffeni*, Hodgson.

*Pallenopsis vanhoeffeni*, Hodgson, 1914–15, p. 145.

*P. gaussiana*, *id.*, *ibid.*

*P. setigera*, *id.*, t.e. p. 146.

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms ; 1 young.

*Remarks*.—The single, very young specimen resembles fairly closely in size and structure the holotype of *P. gaussiana*, with which I have compared it. It seems very probable, however, that *P. gaussiana* is the young form of *P. vanhoeffeni*, Hodgson ; and, indeed, I find that Mr. Hodgson mentions this as a possibility in the description of the species that he has kindly permitted me to see in manuscript. The spines near the antero-lateral margins of the cephalon, which Hodgson notes as distinctive of *P. gaussiana*, are found also, although reduced in size, in the adult *P. vanhoeffeni*. The species appears to be distinguished at all stages from *P. pilosa* by the fact that the trunk-segments are all coalesced.

I venture also to place *P. setigera* as a synonym of the same species. Mr. Hodgson relies for its discrimination largely upon the structure of the ovigers, which are stated to be club-shaped and composed of seven segments. The only adult specimen among the syntypes that I have examined is a male in which the oviger of the left side is broken off in the middle of the fifth segment. The right oviger has the sixth segment not perceptibly inflated or club-shaped ; on its distal surface is a brown annular scar, from the centre of which rises a shrivelled soft papilla. There can be little doubt that the abbreviated condition of this oviger is the result of accident. In other respects the specimen appears to me indistinguishable from *P. vanhoeffeni*.

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\* From “Challenger” Station 157, depth 1,950 fathoms. The specimen recorded from Station 147 is not now in the collection.

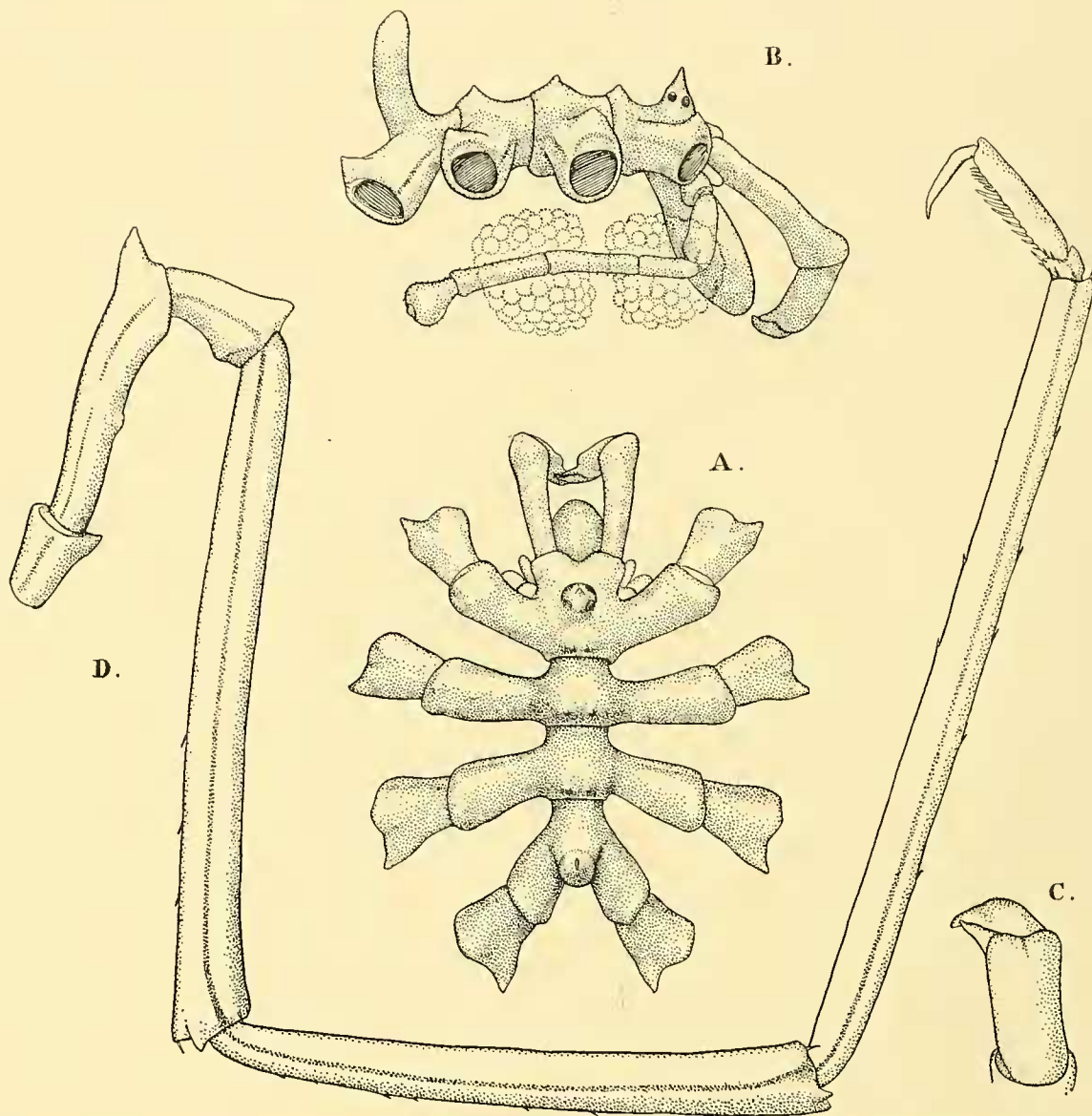
*Pallenopsis spicata*, Hodgson (Text-fig. 9).*Pallenopsis spicata*, Hodgson, 1914-15, p. 146.*Occurrence*.—Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♂ oviger.*Description*.—*Trunk* distinctly segmented, the first three somites each with a pair of conical tubercles on dorsal surface close to hinder margin. Lateral processes

FIG. 9.—*Pallenopsis spicata*, Hodgson, Male. A. Dorsal view of body with chelophores, palps, and first coxæ. B. Lateral view of body with chelophore and oviger. Outlines of egg-masses dotted. C. Chela, further enlarged. D. Third leg of right side.

separated by intervals of at least half their own diameter, each with a bluntly conical tubercle distally. Cephalic segment hardly equal in length to the two following somites together. Cephalon little produced over base of proboscis, occupying about

half the length of cephalic segment, much wider than long, slightly swollen over base of each chelophore. Ocular tubercle conical nearly from the base, not much taller than its basal diameter; anterior eyes hardly larger than posterior.

*Proboscis* directed obliquely downwards, slightly inflated, conoidal at apex.

*Abdomen* almost vertical, cylindrical, blunt.

*Chelophores* with scape undivided, palm of chela half as long as scape, movable finger with its distal or outer surface greatly swollen for two-thirds of its length, but bearing only a very few minute setæ.

*Palp* an elongate papilla wedged in between bases of chelophore and oviger.

*Ovigers* composed of seven segments; fourth and fifth equal, each more than half as long again as third, sixth little more than half as long as fifth, greatly dilated, pyriform, its greatest width twice that at the base, pale in colour and soft, set with minute recurved setæ; seventh segment forming a small soft papilla on distal surface of sixth.

*Legs* long and rather slender. First coxa with posterior corner of distal margin on dorsal side produced and conical. Second coxa much longer than the other two together, with a well-marked gland-tubercle about the middle of its upper surface and the distal end produced ventrally into a large acutely conical process which, in the last two pairs, carries the genital aperture on its proximal slope near the apex. Third coxa with lower distal angle also produced but less acute. Femur and first tibia and, less distinctly, second tibia, with three conical tubercles at distal end above, and one obscure tubercle on each side below, the lateral line. Opening of femoral cement-gland not detected, no projecting duct present. Second tibia with a distinct distal fringe of spines below. Propodus with ventral spines increasing in size from base for two-thirds of its length, beyond which is a group of smaller spines. Main claw about two-thirds as long as propodus. No auxiliary claws.

Surface of body and limbs smooth and naked, with only a few scattered spinules on the legs.

*Measurements, in mm.—*

Length of proboscis . . . . .	4·25
Greatest width of proboscis . . . . .	1·75
Length of cephalon . . . . .	1·5
Width of cephalon . . . . .	2·6
Length of cephalic segment . . . . .	3·0
Length of trunk . . . . .	7·25
Width between first and second lateral processes . . . . .	1·4
Width across second lateral processes . . . . .	7·75
Length of abdomen . . . . .	3·25
Length of scape of chelophore . . . . .	3·75
Length of palm of chela . . . . .	2·0

Third right leg—							
First coxa	.	.	.	.	.	.	2·0
Second coxa	.	.	.	.	.	.	6·0
Third coxa	.	.	.	.	.	.	2·25
Femur	.	.	.	.	.	.	16·5
First tibia	.	.	.	.	.	.	14·0
Second tibia	.	.	.	.	.	.	19·0
Tarsus and propodus	.	.	.	.	.	.	3·75
Claw	.	.	.	.	.	.	2·0

*Remarks.*—The specimen described above resembles the holotype, which is also a male, in almost every detail except that it is considerably larger.

This species differs from the typical forms of the genus *Pallenopsis* in the absence of auxiliary claws\* and of the femoral gland-duct of the male, and most conspicuously in the structure of the ovigers. In the first of these characters it resembles *P. macronyx*, Bouvier, and, apparently, *P. brevidigitata*, Möbius.† The femoral duct is reduced to a papilla in the former of these species, and is not described or figured in the latter. An important point of resemblance is found in the ovigers of the male sex of *P. brevidigitata*, which have the sixth segment enlarged and pear-shaped. In that species, however, four normal segments follow the sixth, while in *P. spicata* the whole distal part is represented by a small papilla. It is worthy of note that this reduced number of segments in the oviger is found in the male sex, since it is in the female that other species of the genus show a tendency to a reduction of this appendage and a coalescence of some of its segments (Loman, 1908, p. 63). It would be of interest to know the condition of the oviger in the female and young of *P. spicata*. The condition found in the adult type-specimen of Hodgson's "*P. setigera*," described above, suggests as a possibility that the terminal segments may even be deciduous in the adult male.

#### GENUS PHOXICHILIDIUM, Milne-Edwards.

##### *Phoxichilidium australe*, Hodgson (Text-fig. 10).

*P. australe*, Hodgson, 1914–15, p. 145.

*Occurrence.*—Station 355, McMurdo Sound, 300 fathoms; 2 ♂, 1 ♀.

*Description of male.*—*Trunk* elongated, segmentation distinct, lateral processes separated by about their own diameter. Cephalon narrowed in front, and produced over base of proboscis. Ocular tubercle more than half as wide as anterior part of cephalon, not higher than wide, inclined forwards, broadly rounded, with a small apical tubercle. Eyes dark.

\* Cf. also Hodgson's *Heteropallene* (1910b, p. 225).

† Although Möbius mentions "2 Nebenklauen" among the characters of the genus, they are omitted from his figures and not mentioned in his description of this species.

*Proboscis* slightly curved upwards, widest distally, and with a slight swelling about the middle; with a pair of short, conical teeth at lower angles of its truncated distal extremity.

*Abdomen* short and blunt, obliquely raised.

*Chelophore* extending well beyond proboscis, scape slender and curved, chela small, fingers gaping.

*Oviger* of five distinct segments, the third showing by a suture-line near the base that it consists of two segments coalesced. Terminal segment as long as preceding, with a few recurved spines.

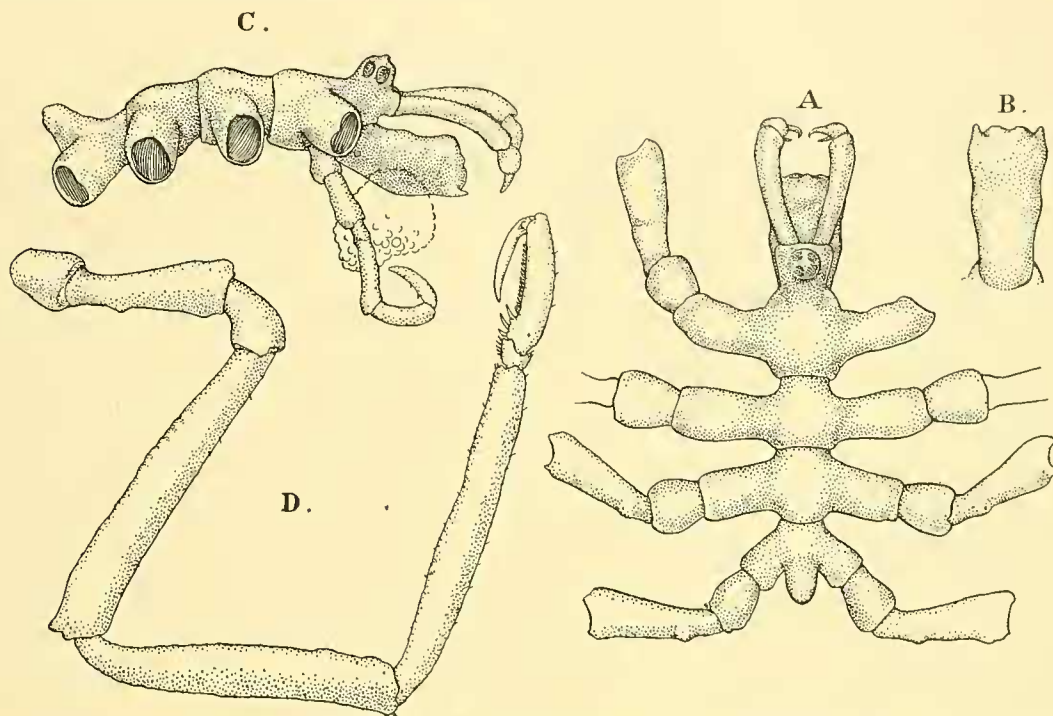


FIG. 10.—*Phoxichilidium australe*, Hodgson, Male. A. Dorsal view of body with chelophores and first and second coxæ. B. Ventral view of proboscis. C. Lateral view of body with chelophores and oviger. Outline of egg-mass dotted. D. Fourth leg of right side.

*Legs* with second coxæ longer than the other two together. Femur, first and second tibiæ subequal. Propodus with three stout spines at base of ventral edge, followed by a series of small spines of uniform size extending to near base of claw. Main claw two-thirds of length of propodus, auxiliaries very minute. A series of about seven inconspicuous tubercles on dorsal surface of femur carrying the large openings of cement-glands.

*Measurements, in mm.*—

	Station 355.
	♂
Length of proboscis (below) . . . . .	1.76
Greatest diameter of proboscis . . . . .	.72

Length of trunk . . . . .	3·08
Length of cephalic segment . . . . .	1·2
Width between first and second lateral processes . . . . .	·52
Width across second lateral processes . . . . .	2·64
Fourth right leg—	
First coxa . . . . .	·52
Second coxa . . . . .	1·4
Third coxa . . . . .	·76
Femur . . . . .	3·2
First tibia . . . . .	3·08
Second tibia . . . . .	3·2
Tarsus and propodus . . . . .	1·48
Claw . . . . .	·76

*Remarks.*—The identification of the "Terra Nova" specimens with Hodgson's briefly described species has been confirmed by comparison with one of the syntypes.

The presence of only five segments in the oviger shows that the species must be referred to *Phoxichilidium* in the sense in which the genus is accepted by Loman (1908, p. 64). According to that author, only two of the described species belong to this genus—namely, *P. femoratum* (Rathke) and *P. robustum* (Dohrn). Hodgson's species agrees with the latter in the form of the proboscis (in which it also agrees with certain species, such as Dohrn's *P. angulatum*, that would be referred by Loman to *Anoplodactylus*), but differs in having the body segmented, the lateral processes separated, and the legs much longer and more slender.

#### GENUS ENDEIS, Philippi.

*Endeis*, Philippi, 1843, p. 175; Norman, 1908, p. 231.

*Chilophoxus*, Stebbing, 1902, p. 187.

*Phoxichilus*, auctt. plur. nec Latreille, 1804, p. 137.

*Genotype.*—*Endeis gracilis*, Philippi, 1843, p. 176, Pl. ix, fig. 1.

*Remarks.*—Nothing appears to be wanting to justify Norman's restoration of *Endeis* in place of Stebbing's *Chilophoxus*, except a formal designation of the genotype, which is here supplied. Loman (1911, p. 16) states that Philippi described the ovigers (under the name of palps) as having eight segments, and bases on this a protest against the proposed change of name. As a matter of fact, Philippi's description and figure agree in attributing seven segments to the so-called "palps." In a later paper, Loman (1915, p. 200) makes no mention of this discrepancy, but maintains his protest on a different ground, "Puisque Philippi relève lui-même les différences entre *Endeis* et *Phoxichilus*, il serait par trop téméraire de vouloir identifier ces deux genres." The reply to this would seem to be that, whatever Philippi may have thought about it, his figures show clearly that he had before him a specimen congeneric with *Phalangium*



*spinosum*, Montagu. The fact that Schimkewitsch (1913, p. 605) has discovered a type-specimen of *Endeis didactyla* and has identified it with Dohrn's *Ammothoa magpirostris* only proves that Philippi's generic diagnosis, upon which Loman lays stress, agrees with neither of the species upon which it was based.

*Endeis australis* (Hodgson) (Text-fig. 11).

*Phoxichilus australis*, Hodgson, 1907, p. 5, Pl. 1, fig. 1; Bouvier, 1913, p. 118, text-fig. 74.

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 1 ♀. Station 314, McMurdo Sound, 222–241 fathoms; 1 ♂, 2 ♀. Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♀. Station 340, off Granite Harbour, 160 fathoms; 2 ♀. Station 355, McMurdo Sound, 300 fathoms; 1 ♂.

*Remarks*.—To the descriptions of this species by Hodgson and by Bouvier it may be added that a pair of small tubercles, more prominent in some specimens than in others, are present on the anterior margin of the cephalon above the base of the proboscis (Fig. 11). These tubercles appear to correspond to those regarded by Dohrn as vestiges of the chelophores. The orifices of the cement-glands described by Bouvier cannot be discerned in either of the males in this collection, possibly owing to the specimens not being fully mature.

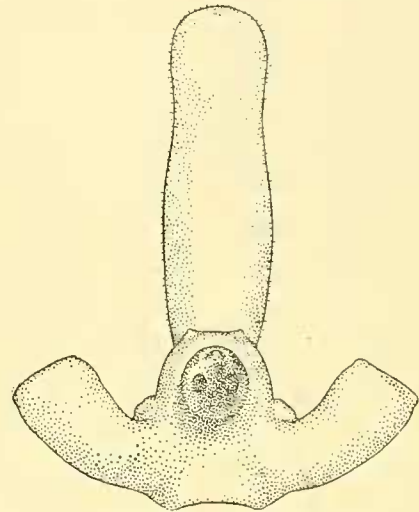


FIG. 11.—*Endeis australis* (Hodgson). Dorsal view of cephalic segment and proboscis of specimen showing well-developed cephalic tubercles.

GENUS AMMOTHEA, Leach.

*Ammothoa*, Leach, 1814, p. 33.

*Leionymphon*, Möbius, 1902, p. 183.

I have elsewhere (1915*a*) re-described the holotype of Leach's *Ammothoa carolinensis*, with which I have attempted to show that Pfeffer's *A. grandis* is identical.

Bouvier (1913, p. 122) includes, among the characters distinguishing this genus from *Achelia*, "pas de saillie cémentaire fémorale." While it is true that there is no conspicuous prominence as in *Achelia*, the opening of the femoral cement-gland is very distinct, at a little distance from the end of the femur on the dorsal surface, and in *A. meridionalis* it is elevated on a gentle swelling visible in side view (Fig. 12, C and D, p. 54). Bouvier also, in his key, distinguishes *Ammothella* from *Ammothoa* only by the biarticulate scape of the chelophores, but as he includes in *Ammothella* the *Achelia hispida* of Hodge, which has an unjointed scape, it might be better to use for this purpose the transverse ridges of the trunk somites, which are very distinct in all the species of the present genus.

*Ammothea glacialis* (Hodgson).*Leionymphon glaciale*, Hodgson, 1907, p. 50, Pl. vii, fig. 3.*Ammothea glacialis*, Bouvier, 1913, p. 123.

*Occurrence*.—Station 194, off Oates Land, 180–200 fathoms; 1 young. Station 220, off Cape Adare, 45–50 fathoms; 1 immature. Station 314, McMurdo Sound, 222–241 fathoms; 5 immature. Station 318, McMurdo Sound, 130–180 metres; 1 young. Station 322, McMurdo Sound, 20 metres; 1 ♀. Station 338, Entrance to McMurdo Sound, 207 fathoms; 2 ♀, 2 ♂ (ovig.), 3 immature. Station 340, off Granite Harbour, 160 fathoms; 2 ♀, 1 ♂ (ovig.), 2 immature, 1 young. Station 355, McMurdo Sound, 300 fathoms; 1 ♂ (ovig.), 3 immature. Station 356, off Granite Harbour, 50 fathoms; 1 young.

*Remarks*.—This species has hitherto been known only by the immature holotype obtained by the "Discovery" and an adult female recently recorded by Hodgson from the "Gauss" collection. It is the most abundant species of the genus in the collections of the "Terra Nova."

Adult specimens are little larger than the holotype, with which they agree except as regards the chelophores and, in the males, the ovigers. The form of the proboscis is better indicated by Hodgson's description than by his figure. The ovigers of the male have the distal segments modified as in other species of the genus; the terminal segment is little longer than the preceding.

*Measurements*, in mm., of adults from Station 338.—

	♀	♂
Length of proboscis . . . . .	12	10·5
,, trunk . . . . .	9	9·5
,, abdomen . . . . .	4	3·5
Third right leg—		
Coxæ . . . . .	11·5	11
Femur . . . . .	17·25	15
First tibia . . . . .	14·5	13·5
Second tibia . . . . .	19	18·5
Tarsus and propodus . . . . .	4·72	4·8
Main claw . . . . .	2·32	2·4
Auxiliaries . . . . .	1·24	·92
Palp—		
Second segment . . . . .	4·8	4·4
Fourth segment . . . . .	6·28	5·72

*Young Stages*.—Four very young specimens included in the list given above (Stations 194, 318, 340 and 356) are only referred to this species with some doubt. Their most conspicuous character is the presence on the legs of coarse short spines set in longitudinal rows; in the smaller specimens each spine is elevated on a conical

prominence. The double dorsal tubercles of the lateral processes and first coxæ are also beset with short spines. The proboscis is about as long as the trunk, conical in the smaller specimens, but becoming slightly pyriform in the larger, decurved, with a slight constriction at one-third its length from the base. The transverse body-ridges have acute spine-like median processes as tall as the ocular tubercle. The fourth segment of the palp is not more than one-third longer than the second. The ovigers are represented only by minute buds.

In their spiny armature, these specimens resemble those described by Bouvier (1906, p. 20) as *A. curculio*, but afterwards (1913, p. 127) regarded by him as the young of *A. gibbosa*. They differ, however, in the form of the proboscis, which, in our specimens, is much stouter, and in the larger specimens shows a tendency towards a pyriform shape; further, in our largest specimens the second segment of the palp is three-quarters as long as the fourth, while in specimens of *A. gibbosa*, only a little larger, the proportion, in Prof. Bouvier's figure, is less than one-half.

*Ammothea gibbosa* (Möbius).

*Colossendeis gibbosa*, Möbius, 1902, p. 192, Pl. xxx, figs. 1-5.

*Ammothea curculio*, Bouvier, 1906, p. 20; *id.*, 1907, p. 40, figs. 19-22.

*Leionymphon gibbosum*, Hodgson, 1907, p. 40.

*Leionymphon grande*, Hodgson, 1907, p. 41, Pl. vi. fig. 1 (*nec Ammothea grandis*, Pfeffer, 1889, p. 43).

*Ammothea gibbosa*, Bouvier, 1913, p. 127, figs. 78-82.

*Occurrence*.—Station 220, off Cape Adare, 45-50 fathoms; 3 immature.

*Remarks*.—Bouvier, while referring some of his specimens to *A. grandis*, Pfeffer, and others to *A. gibbosa* (Möbius), expresses a doubt as to the separation of these two species. He also points out that the "Discovery" specimen figured by Hodgson as *A. grandis* shows some of the characters that he regards as distinctive of *A. gibbosa*.

The specimens obtained by the "Terra Nova," which are all immature, undoubtedly belong to the same species as the "Discovery" specimens. Like these, they differ much from some South Georgia specimens in the Museum collection, which I take to represent the *A. grandis* of Pfeffer and to be indistinguishable from the earlier *A. carolinensis* of Leach (Calman, 1915*a*, p. 314). The latter have the setules on the body and limbs shorter, more closely set, and much less distinctly separated in longitudinal bands, especially on the tibiæ, than have the "Discovery" and "Terra Nova" specimens; further, the abdomen is much more horizontal, and the distal ridge on the lateral processes is less distinctly bilobed. The median dorsal processes of the body-ridges are not, however, noticeably higher in the one case than in the other, and in none of the specimens are they so much expanded at the tip as in Bouvier's figure of the adult *A. gibbosa*. The somewhat greater length of the propodus in the South Georgia specimens also agrees with Bouvier's conception of *A. grandis*. On the other hand, Hodgson, after examining the type-specimens of Möbius and of Pfeffer, states that the specific identity of the "Discovery" specimens with the latter was established

"beyond all doubt." The matter cannot, perhaps, be settled without a renewed appeal to the type-specimens, but the evidence available indicates that the "Discovery" and "Terra Nova" specimens should be referred to *A. gibbosa*, and that *Leionymphon grande*, Hodgson 1907, should be removed from the synonymy which I recently (1915a, p. 314) gave for *A. carolinensis*, Leach.

*Measurements, in mm.*—The following measurements are taken from adult females:—

	<i>Ammothea gibbosa</i> . "Discovery."	<i>Ammothea grandis</i> . South Georgia.
Length of proboscis . . . . .	15·5	13
,, trunk . . . . .	11	10
,, abdomen . . . . .	3·5	3·25
Third right leg—		
Coxæ . . . . .	12·5	10
Femur . . . . .	14·5	11
First tibia . . . . .	13	10
Second tibia . . . . .	17	12·5
Tarsus and propodus . . . . .	5	5·6
Main claw . . . . .	2	2·3
Auxiliaries . . . . .	1·28	1·28

*Ammothea spinosa* (Hodgson).

*Leionymphon spinosum*, Hodgson, 1907, p. 49, Pl. vii, fig. 2.

*Ammothea spinosa*, Bouvier, 1913, p. 123.

*Occurrence.*—Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♀, 1 ♂.

*Remarks.*—This well-marked species was described by Hodgson from a single female specimen, with which the two now examined agree closely, the male differing only in the structure of the ovigers.

*Ammothea minor* (Hodgson).

*Leionymphon minus*, Hodgson, 1907, p. 44, Pl. vi, fig. 2.

*Ammothea minor*, Bouvier, 1913, p. 131, figs. 83, 84.

*Ammothea gracilipes*, Bouvier, 1913, p. 132, figs. 85–87.

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 1 ♀, 1 immature. Station 340, off Granite Harbour, 160 fathoms; 1 ♂. Station ?, 1 ♀, 3 immature.

*Remarks.*—The specimens obtained by the "Terra Nova" unquestionably belong to the same species as the types of the "Discovery" collection, and, like them, agree rather better with Bouvier's account of the species he describes as *A. gracilipes* than with the immature specimen that he identifies with Hodgson's species. In the larger specimens the abdomen is much elevated, the legs, if not quite so slender as in Bouvier's figure of *gracilipes*, much more so than in that of *minor*, and the second coxa equal in length to the sum of the other two. In the smaller specimens the proportions

of the legs, and in particular of the second coxa, approach more nearly to those of Bouvier's figure of *A. minor*, but the abdomen is still elevated.

*Measurements, in mm.*—

	"Discovery."	
	Holotype.	"Terra Nova."
Length of proboscis . . . . .	♂ 3·6	♂ 3·4
,, trunk . . . . .	3·4	3·6
,, abdomen . . . . .	1·12	1·2
Third right leg—		
First coxa . . . . .	1·22	1·4
Second coxa . . . . .	2·32	2·6
Third coxa . . . . .	1·4	1·2
Femur . . . . .	6·88	7·2
First tibia . . . . .	7·04	6·8
Second tibia . . . . .	8	8
Tarsus and propodus . . . . .	2·8	2·8
Main claw . . . . .	1·6	1·6
Auxiliaries . . . . .	·72	·68

*Ammothea australis* (Hodgson).

*Leionymphon australe*, Hodgson, 1907, p. 46, Pl. vii, fig. 1.

*Ammothea australis*, Bouvier, 1913, p. 123.

*Occurrence.*—Station 331, Entrance to McMurdo Sound, 250 fathoms; 1 ♂. Station 338, Entrance to McMurdo Sound, 207 fathoms; 1 ♂. Station 340, off Granite Harbour, 160 fathoms; 1 ♂, 1 young. Station 356, off Granite Harbour, 50 fathoms; 1 young.

*Remarks.*—The specimens agree closely with syntypes of the "Discovery" collection and differ from specimens, which I refer to *A. clausii*, from South Georgia and the South Sandwich Islands, in having the abdomen obliquely set and separated by a short interval from the articulation between the last two trunk-somites, the apex of the ocular tubercle rounded with a small central spike instead of conical, and the setæ of the body and limbs less numerous. The spinous character of the young, referred to by Mr. Hodgson, is noteworthy.

*Ammothea meridionalis*, Hodgson (Text-fig. 12).

*Ammothea meridionalis*, Hodgson, 1914-15, p. 246.

*Occurrence.*—Station 356, off Granite Harbour, 50 fathoms; 1 ♂ ovig.

*Description.*—*Lateral processes* (except the last two pairs) separated by intervals much less than half their own diameter. Transverse body-ridges prominent, rising in the middle line into acutely conical processes. Cephalon wider than long, contracted behind, with a pair of spinose tubercles over the bases of the chelophores. Paired

tubercles on the lateral processes fairly prominent. Ocular tubercle as tall as first transverse ridge, clavate, rounded above with an inconspicuous apical tubercle situated behind the middle.

*Proboscis* about as long as trunk, slightly contracted before the middle of its length, then conical towards the tip.

*Abdomen* nearly horizontal, narrowing a little from the base, half as long as the trunk.

*Chelophores* unusually long, extending to or beyond the middle of the proboscis, scape about five times as long as wide, slightly dilated, and armed with spines distally.

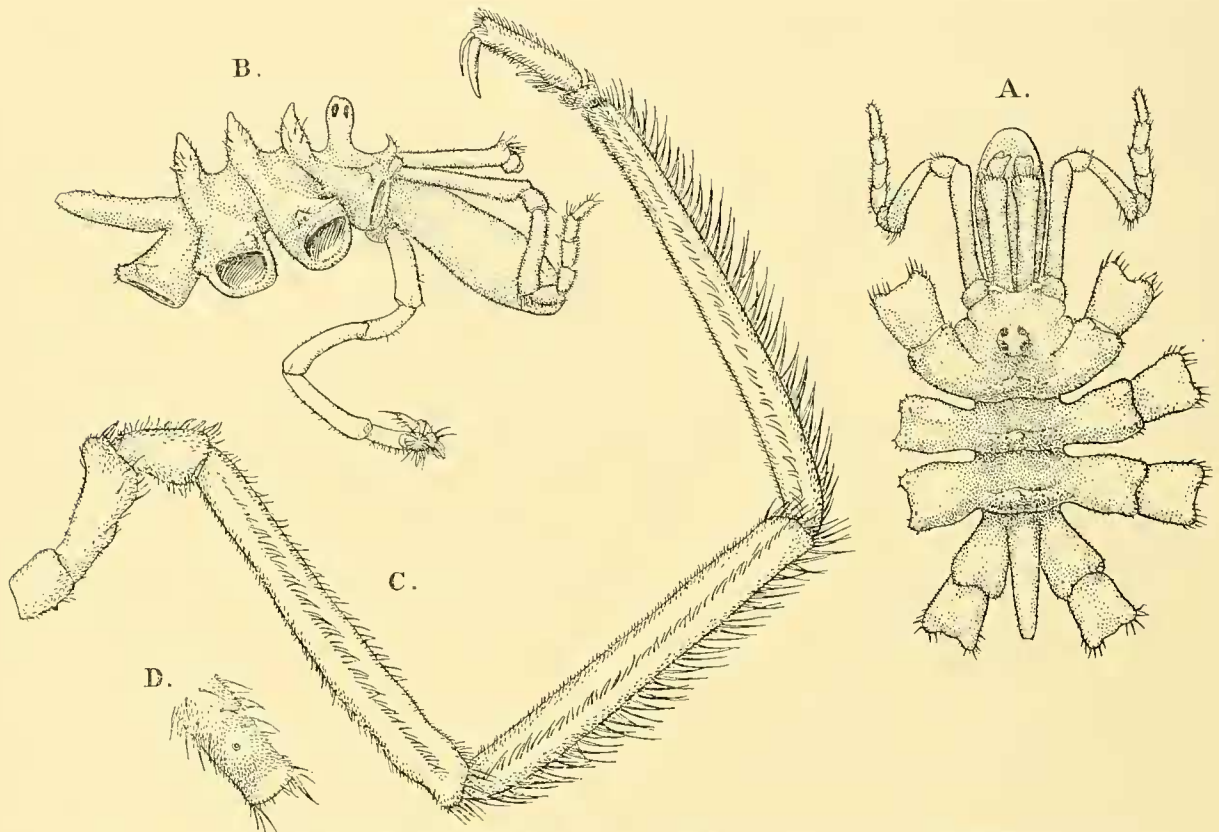


FIG. 12.—*Ammothea meridionalis*, Hodgson, Male. A. Dorsal view of body with chelophores, palps, and first coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Third leg of left side. D. Terminal part of femur from above to show opening of cement-gland.

*Palp* with second segment one-third to one-half as long again as fourth, the distal segments not dilated or serriform. *Oviger* with terminal segment more slender and a little longer than penultimate.

*Second coxa* twice as long as first, which is a little shorter than third. Femur equal to first tibia, and shorter than second. Propodus nearly straight, main claw more than half its length, auxiliaries two-thirds as long as main claw.

Body and limbs covered with minute close-set setæ, among which on the legs are

scattered very much longer setæ; these become especially conspicuous on the tibiæ, where they are set in four rows, two dorsal and two lateral.

*Measurements, in mm.*—

	"Gauss."	"Terra Nova."
	Holotype.	♂
Length of proboscis . . . . .	4·9	5·2
„ trunk . . . . .	4·4	5·4
„ abdomen . . . . .	2·24	2·48
„ chelophores . . . . .	2·4	2·88
Third left leg—		
Coxæ . . . . .	—	6·6
Femur . . . . .	12	10·5
First tibia . . . . .	12	10·5
Second tibia . . . . .	14	12·5
Tarsus and propodus . . . . .	—	3·28
Main claw . . . . .	—	1·52
Auxiliaries . . . . .	—	1·0
Palp—		
Second segment . . . . .	2·64	3·0
Fourth „ . . . . .	2·0	2·0

*Remarks.*—In the great length and slenderness of the chelophores, in having the second segment of the palp much longer than the fourth, and in the very long hairs with which the limbs are beset, this species differs remarkably from all those hitherto described in this genus.

The holotype described by Mr. Hodgson differs from the "Terra Nova" specimen here figured only in having the chelophores a very little shorter, the second segment of the palp only about one-third, instead of one-half, longer than the fourth, and the abdomen a little longer, rather more elevated, and more clavate.

*Ammothea striata* (Möbius)?

*Leionymphon striatum*, Möbius, 1902, p. 183, Pl. xxvi, figs. 7-12.

*Ammothea striata*, Bouvier, 1913, p. 124, figs. 75-77.

*Occurrence.*—Station 194, off Oates Land, 180-200 fathoms; 1 ♂.

*Remarks.*—A single specimen of large size is referred, although with considerable doubt, to this species. Unfortunately, it is in such bad condition as to make a full determination of its characters impossible, the exoskeleton being soft and almost membranous, the body contracted, and the legs collapsed and crumpled.\*

The most conspicuous feature of the specimen is the shortness of the proboscis, which measures only about 9 mm., while the length of the trunk is about 14 mm. As

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\* Mr. Lillie notes that the bottom at Station 194 consisted largely of "undecomposed animal *débris*."

regards this point, the accounts of *A. striata* are somewhat obscure. Möbius says that the proboscis is "fast so lang wie der Rumpf," but his figures show it as either about half or two-thirds as long. Bouvier describes it as "légèrement plus longue que le tronc," and figures it as little more than half as long. Both authors agree, however, that the proboscis is curved downwards, while in our specimen it is straight. Further, the abdomen is horizontal, the oviger more slender than in Bouvier's figure, and with the penultimate segment more nearly equal to the terminal one, the propodus has three or four very large spines on its inner edge, and the auxiliary claws are not more than one-fourth of the length of the main claw. The other characters, so far as they can be determined, are in general agreement with the accounts of *A. striata*. No fully adult specimen of this species appears to have been figured. Bouvier, although he enumerates only adults as having been taken by the "Pourquoi Pas?", figures a male with chelate chelophores, and, therefore, presumably immature.

#### GENUS ACHELIA, Hodge.

Hodge, 1864, p. 114.

Hodgson (1910a, p. 436) having revived the name *Achelia*, Bouvier (1913, pp. 46 and 138) has restricted it to those Ammotheidæ that have eight segments in the palp, giving at the same time a warning that certain earlier names might have a claim to supersede it. The validity of these earlier names depends on the identification of species from European seas that cannot be discussed here, and I am content to follow Bouvier in using Hodge's name for the genus.\*

Hodgson (1914-15, p. 147) has proposed a new genus *Austrothea* for two species which appear, from an examination of his type-specimens, to differ in no respect from the typical form of *Achelia* except that they have well-separated lateral processes and longer legs. It is clear that these characters by themselves cannot furnish a basis for generic distinction, and, in fact, the present collection gives evidence that they are subject to variation within the limits of a species. I propose, therefore, to regard *Austrothea* as a synonym of *Achelia*. Of the two species of *Austrothea* described by Hodgson, one, *A. spicata*, is represented by many specimens in the "Terra Nova" collections and is redescribed below; the other, *A. germanica*, is described by Hodgson from a very young specimen with chelate chelophores, and I can express no opinion on its specific distinctness; like specimens of similar age in the present collection, it has the ocular tubercle very tall, slender, and acutely conical.

More than a hundred specimens belonging to this genus were obtained by the

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\* It may be pointed out, however, that the identification of Costa's *Alcinous vulgaris* with Dohrn's *Ammothea franciscana*, which Bouvier adopts apparently from Norman, might justify, although it does not compel, the use of *Alcinous*; also that, in identifying the still earlier *Paribæa spinipalpis*, Philippi, with *Achelia echinata*, Hodge, Bouvier, by omitting the mark of interrogation placed by Norman against this identification, surrenders our last defence against the revival of Philippi's generic name. See, however, Schimkewitsch (1913, p. 605).



“Terra Nova,” all except three from a single station. The classification of these presents difficulties that I have not been able to solve entirely to my own satisfaction. The vast majority (after putting aside a few young specimens that I have not attempted to refer to their species) can be grouped as shown in the following key, where the groups are regarded as species related to *A. communis* (Bouvier).

*Key to the species of Achelia examined.*

- a. Auxiliary claws less than half as long as principal claw. Ocular tubercle higher than wide, apex conical.
  - a'. First three trunk-somites separated by articulation. Lateral processes separated. Chelophores extending to middle of proboscis . . . . . *A. spicata* (Hodgson)
  - b'. All trunk-somites coalesced. Lateral processes in contact. Chelophores extending to one-third of length of proboscis . . . . . *A. intermedia*, sp. n.
- b. Auxiliary claws more than half as long as principal claw. Ocular tubercle not higher than wide, rounded, with an apical point.
  - a'. First three trunk-somites separated by articulation. Chelophores extending to middle of proboscis. Antero-lateral tubercles of cephalon prominent . . . . . [*A. communis* (Bouvier)]
  - b'. All trunk-somites coalesced. Chelophores less than half as long as proboscis. Antero-lateral tubercles obscure or wanting . . . . . *A. brucei*, sp. n.

Unfortunately for the simplicity of this arrangement, however, there remain over three specimens that, on account of differences in the segmentation of the body, are excluded from all these categories, and there are a few others in which the agreement with one or other of the species is not so obvious and complete as might be desired. The number of these aberrant specimens is so small that it is perhaps justifiable to leave them out of account as “abnormal,” but, added to the variations that occur within the groups here treated as specific, they tend to shake our confidence in the stability of these groups. I am inclined to think that future work may result in ranking *A. intermedia* as a form of *A. spicata*, and *A. brucei* as a form of *A. communis*, if, indeed, it be not found necessary to include all four under one specific name.

*Achelia spicata* (Hodgson) (Text-figs. 13 and 14).

*Austrothea spicata*, Hodgson, 1914-15, p. 147.

*Occurrence.*—Station 220, off Cape Adare, 45-50 fathoms; 23 ♀, 13 ♂. Station 355, McMurdo Sound, 300 fathoms; 1 ♀, 1 ♂.

*Description.*—*Trunk* hardly longer than its greatest width, across the second lateral processes; first two intersegmental articulations very distinct, third marked only by a faint superficial groove. Lateral processes more or less well separated, the last two pairs usually separated to the base; a pair of dorsal tubercles, the posterior the larger, on each of the first three lateral processes, and a small anterior tubercle only on the last lateral process. Cephalon a little wider than long, without antero-lateral tubercles. Ocular tubercle much higher than wide, inclined forwards, conically tapered above the eyes; anterior pair of eyes not much larger than posterior.

*Proboscis* about two-thirds of length of trunk, widest about the middle, where its width is less than half its length.

*Abdomen* horizontal, little shorter than proboscis, reaching beyond middle of second coxa of last legs, slightly clavate and bluntly pointed.

*Chelophores* extending to, or a little beyond, middle of proboscis. *Palps* with second and fourth segments equal, sixth and seventh produced ventrally, terminal segment little longer than preceding.

*First coxæ* each with two conical tubercles of which the posterior is the larger. Femur and first and second tibiæ subequal or slightly longer successively; femur from about three times as long as deep in the female to more than six times in the male. Auxiliary claws one-third as long as main claw.

*Sexual differences*.—Apart from the usual differences in the diameter of the femora, the males apparently tend to have the trunk more elongated and the lateral processes more widely separated than in the females; they have also the tubercles on the lateral processes more prominent and those of the first coxæ forming spurs which may be as long as the width of the segment.

*Variation*.—The specimens examined differ among themselves in the relative length of the body, the degree of separation of the lateral processes, and the length of the legs. Two extreme types are represented in Figs. 13 and 14, but many specimens are intermediate. In the more elongated forms the spiniform tubercles on the lateral processes and first coxæ are longer, as is also the conical apex of the ocular tubercle.

Two specimens differ from the typical form in the segmentation of the body. In one, there is a very distinct articulation between the last two somites; in the other, the only articulation is between the first two.

*Measurements, in mm.*—The measurements here given are taken from two fairly representative specimens:—

	♂	♀
Length of proboscis . . . . .	1·2	1·04
Greatest width of proboscis . . . . .	·5	·44
Length of trunk . . . . .	1·72	1·6
Width across second lateral processes . . . . .	1·6	1·52
Length of abdomen . . . . .	1·04	·92
Third right leg—		
Coxæ . . . . .	1·52	1·48
Femur . . . . .	1·8	1·84
First tibia . . . . .	1·88	2·0
Second tibia . . . . .	2·0	1·92
Tarsus and propodus . . . . .	1·08	1·2
Main claw . . . . .	·56	·52
Auxiliaries . . . . .	·16	·16

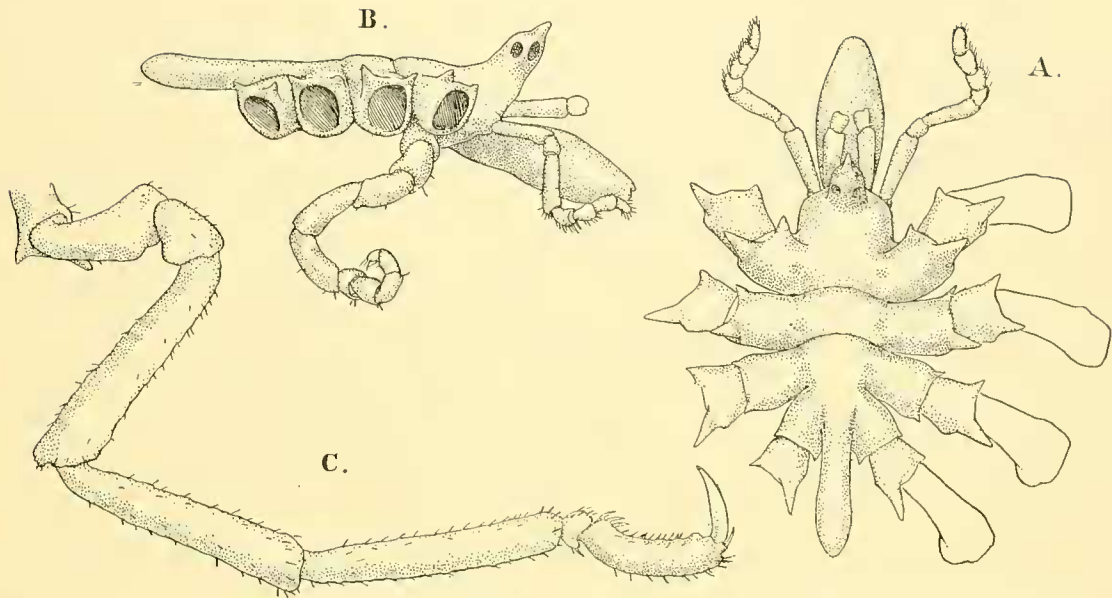


FIG. 13.—*Achelia spicata* (Hodgson), ovigerous Male of the more compact type. A. Dorsal view of body with chelophores, palps, and first and second coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Third leg of right side.

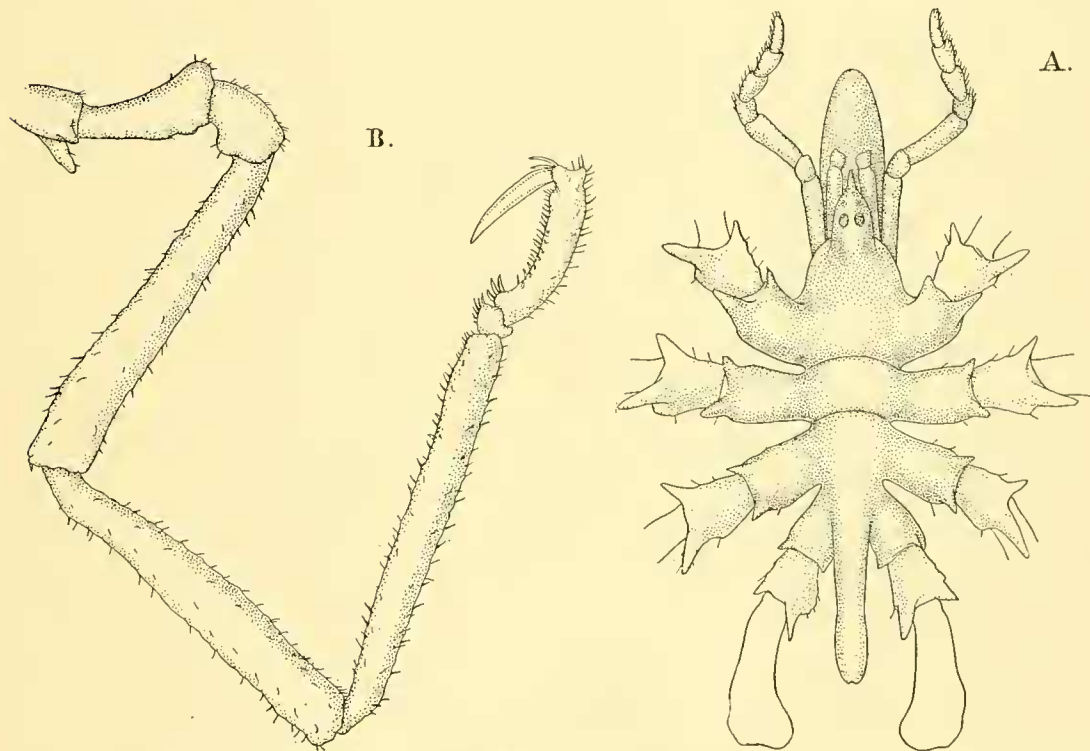


FIG. 14.—*Achelia spicata* (Hodgson), ovigerous Male of the more slender and elongated type. A. Dorsal view of body with chelophores, palps, and first and second coxæ. B. Third leg of right side.

*Remarks.*—I have examined two of Mr. Hodgson's syntypes. One is immature, and the other, an adult female, is of a slender type with very long legs and with the femora less dilated than is usual in this sex. In other respects it resembles very closely indeed the slender male here figured (Fig. 14) except that the lateral processes are not so well separated.

*Achelja intermedia*, sp. n. (Text-fig. 15).

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 5 ♀, 6 ♂ (incl. Holotype).

*Description.*—The specimens that are referred to this species differ from the more compact forms of *A. spicata* only in the following points:—

(1) The lateral processes are all in contact and the segmentation of the body is

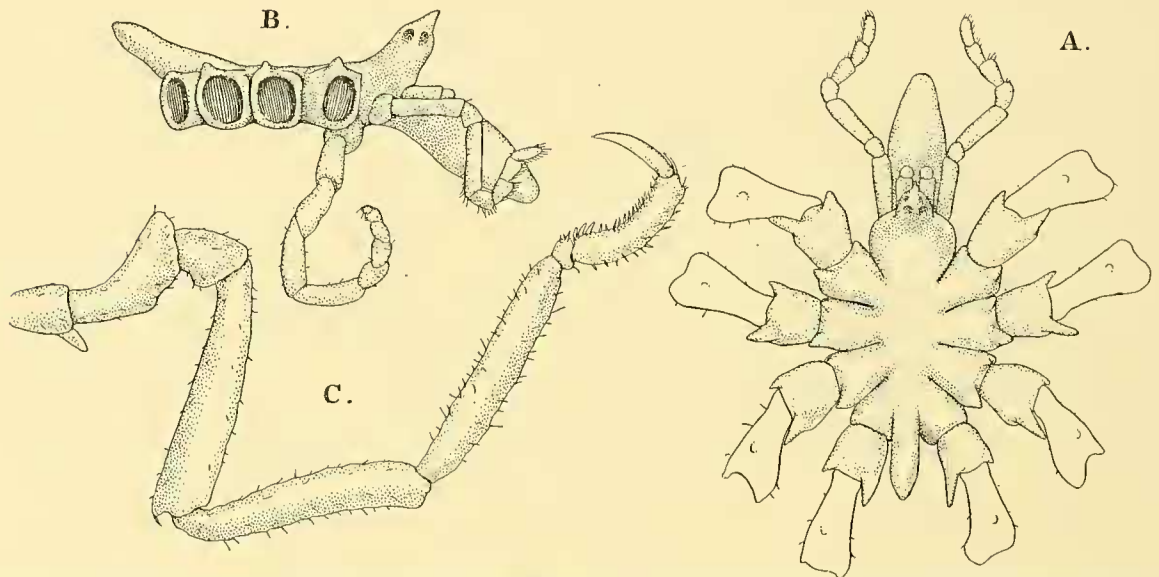


FIG. 15.—*Achelja intermedia*, sp. n., ovigerous Male. A. Dorsal view of body with chelophores, palps, and first and second coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Third leg of right side.

obliterated, the limits of the somites being marked only by faint grooves. The trunk is relatively shorter, less than one-third longer than the proboscis.

(2) The chelophores are much shorter, not extending beyond one-third of the length of the proboscis.

(3) The abdomen is shorter, not reaching to the middle of the coxæ of the last pair.

In all these characters the specimens approach those described below as *A. brucei*. From these, however, they are at once distinguished by the short auxiliary claws and by the much higher ocular tubercle.

*Achelia brucei*, sp. n. (Text-fig. 16).

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 46 ♀, 16 ♂ (incl. Holotype).

*Description*.—The specimens recorded under this name differ from *A. communis* (Bouvier) (of which I have examined four specimens, presented to the British Museum by Prof. Bouvier) only in the following characters:—

(1) The somites of the trunk are defined dorsally only by more or less indistinct grooves on the surface of the integument. Very often the groove between the first and second leg-bearing somites, and less often that between the second and third, are emphasised by differences of colour, but only in one single specimen do these two lines appear to be marked by an actual fold of the integument giving a distinct double outline, as in the specimens of *A. communis*.

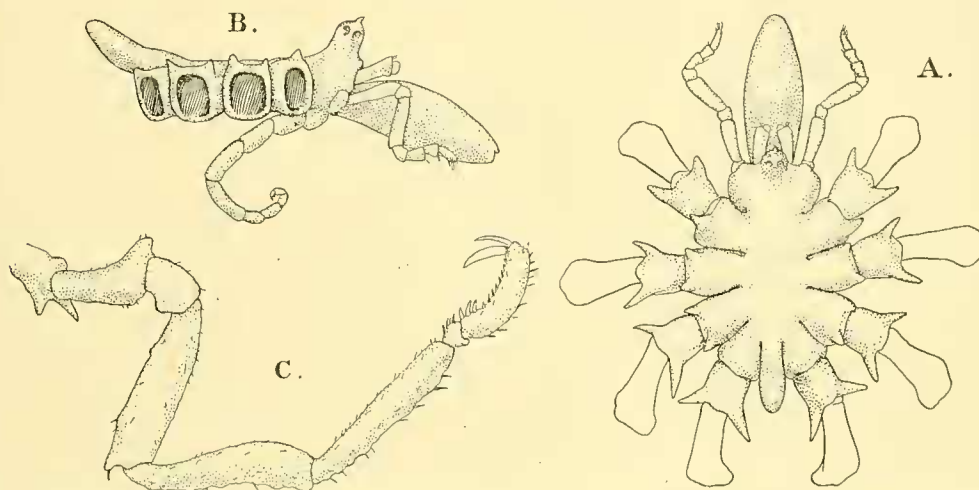


FIG. 16.—*Achelia brucei*, sp. n., ovigerous Male. A. Dorsal view of body with chelophores, palps, and first and second coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Third leg of right side.

(2) The chelophores fall far short of the middle of the proboscis. In the specimens of *A. communis* that I have examined they reach the middle.

(3) The antero-lateral tubercles of the cephalon are very slight or altogether absent in the female, and much less prominent in the male than they are in *A. communis*.

(4) The setæ on the legs are less numerous.

The value of these characters is somewhat discounted by the comments that Bouvier makes on the variability of his species, but the constancy of the segmentation of the trunk in the large number of specimens that I have examined suggests that this character, at all events, is of specific value.

The specific name is chosen in compliment to Commander Wilfred M. Bruce, R.N.R., who, I am informed, gave valuable help in the operations of trawling and dredging on board the "Terra Nova."

## GENUS AUSTRORAPTUS, Hodgson.

In addition to the genotype, *A. polaris*, I have provisionally included in this genus two species, apparently new, which differ from it in characters that might justify generic separation. One species, however, is represented by a solitary specimen, and it is not quite certain, though it is probable, that it has assumed adult characters. The other species might have been removed from the genus without much hesitation were it not for the character of the palps in a young specimen that I suppose to belong to *A. polaris*. If they have been correctly interpreted, the two new species retain respectively in the adult condition two different characters—the chelate chelophores and the eight-segmented palp—that are united in the larva of *A. polaris*.

*Austroraptus polaris*, Hodgson (Text-fig. 17).

*A. polaris*, Hodgson, 1907, p. 54, Pl. viii, fig. 2.

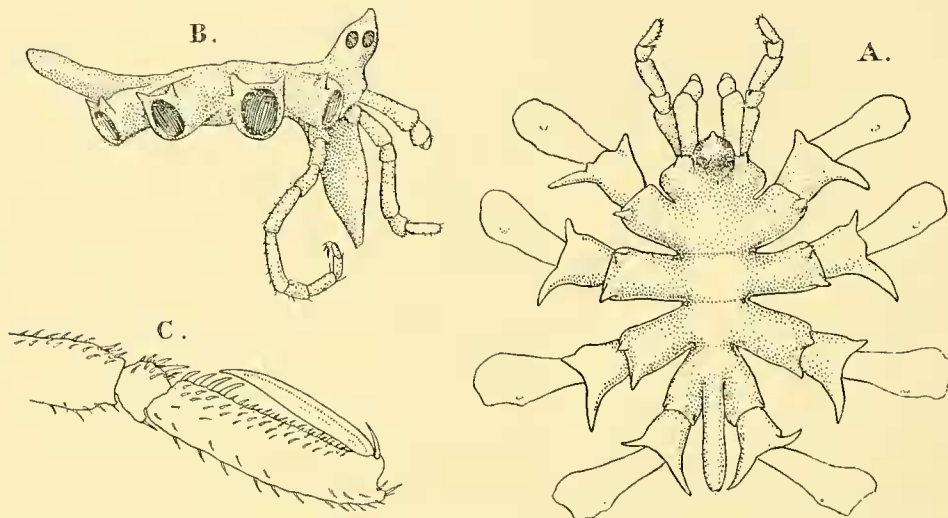


FIG. 17.—*Austroraptus polaris*, Hodgson, Female syntype from "Discovery" collection. A. Dorsal view of body with chelophores, palps, and first and second coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Terminal part of one of the legs.

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 1 ♀, 1 young.

*Measurements, in mm.*—

	"Discovery." Syntype. ♀
Length of trunk . . . . .	2·4
Third right leg—	
Coxæ (together) . . . . .	2·56
Femur . . . . .	4·6
First tibia . . . . .	4·6
Second tibia . . . . .	4·4
Tarsus and propodus . . . . .	1·68
Claw. . . . .	1·0

*Remarks.*—As the figures of this species in Mr. Hodgson's report are not altogether satisfactory, I give some additional figures prepared from the female syntype. The male hardly differs except that the ocular tubercle is taller and more slender. The relative lengths of the long segments of the leg differ a little even in the legs of the same individual. The male has genital apertures on the last two pairs of legs only, not on the last three, as stated in the original description. The female syntype has apertures on all the legs except the second on the right side; this is evidently an abnormal condition, and the "Terra Nova" specimen has apertures on all the legs.

A young specimen, with chelate chelophores, is referred to this species rather than to either of the two following, chiefly because it has the lateral processes separated to the base and the spurs on the lateral processes and first coxæ long and acute. It differs from the adult in having the ocular tubercle produced above the eyes into a long slender apical cone which is longer than the basal part (as in young specimens of *Achelia* in the present collection); the proboscis is more produced at the tip than in the adult; the fingers of the chelæ are strongly arched and gaping. The most important character, however, is that the terminal portion of the palp, corresponding to the terminal segment in the adult, is divided into two segments in the palp of one side and into three in that of the other. This makes it very probable that the young of *A. polaris*, like the adults of *Achelia*, have the palp composed of eight segments, and the retention of this feature in the adults of *A. juvenilis*, described below, need not be regarded as a generic distinction.

*Austroraptus juvenilis*, sp. n. (Text-fig. 18).

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 1 ♂ ovig. (Holotype), 1 ♀.

*Description.*—*Body* compact, the lateral processes in contact for almost the whole of their length, intersegmental lines marked only by superficial grooves. Cephalon about twice as broad as long, inflated laterally and with convex anterior margin; antero-lateral tubercles very small. Ocular tubercle stout, much taller than wide, inclined forwards, the blunt apical cone above the eyes shorter than the basal part. Lateral processes each with a broad rounded tubercle near the posterior distal corner and a more or less vestigial anterior tubercle.

*Proboscis* directed almost vertically downwards, slightly inflated a little beyond the base, then acutely conical with a minutely truncate apex.

*Abdomen* elevated, clavate, about half as long as trunk.

*Chelophores* with scape about twice as long as wide, slightly expanded distally. Second segment irregularly globose.

*Palp* a good deal stouter than that of *A. polaris*, similarly bent at the fifth segment, but having the distal part, which corresponds to the terminal segment of *A. polaris*, divided into three short but very distinct segments, so that the whole palp consists of eight segments.

*First coxa* with a large bluntly conical posterior spur and a small anterior tubercle; second coxa more than twice as long as first or third. Distal segments of legs not much more slender than proximal. Propodus slightly curved, about three

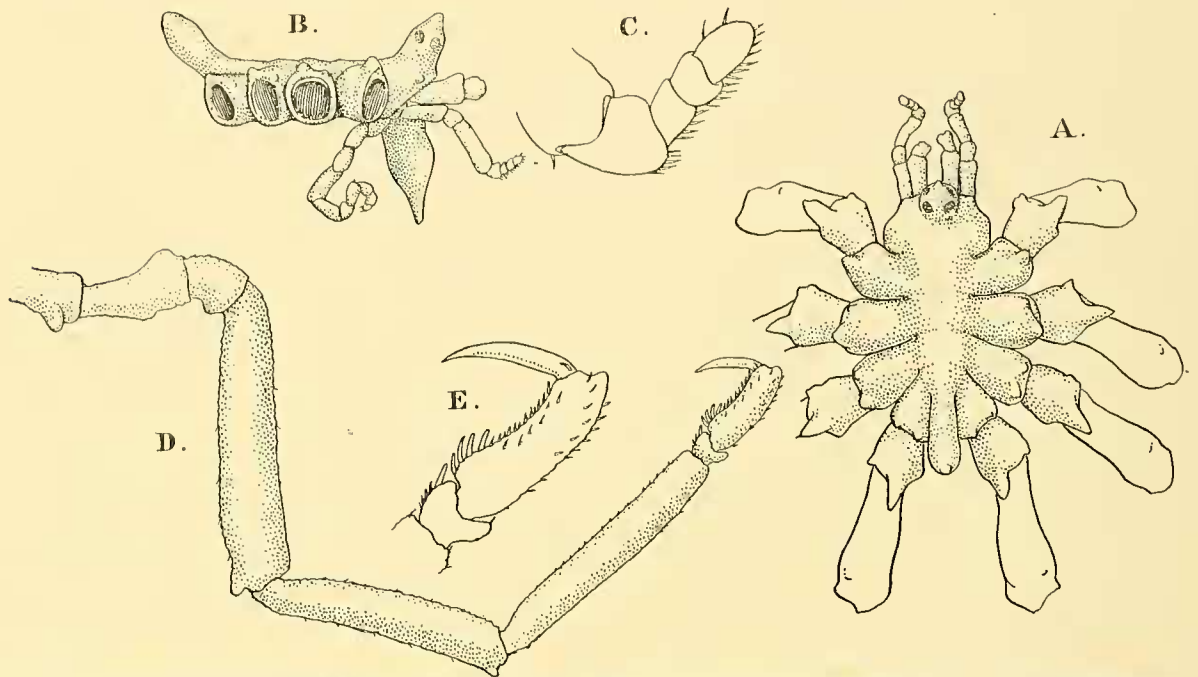


FIG. 18.—*Austroraptus juvenilis*, sp. n. A. Dorsal view of body of ovigerous Male with chelophores, palps, and first and second coxae. B. Lateral view of body of Female with chelophore, palp, and oviger. C. Terminal part of palp of Female. D. Third leg of right side, Female. E. Terminal part of leg.

times as long as broad. Main claw three-quarters as long as propodus; auxiliaries very minute.

*Measurements, in mm.*—

	Holotype.	
	♂	♀
Length of trunk . . . . .	2·2	2·2
Third leg—		
First coxa . . . . .	·48	·48
Second coxa . . . . .	1·6	1·2
Third coxa . . . . .	·6	·52
Femur . . . . .	3·52	3·4
First tibia . . . . .	3·2	2·88
Second tibia . . . . .	3·4	3·2
Tarsus and propodus . . . . .	1·6	1·4
Claw . . . . .	·88	·8

*Remarks.*—In having eight segments in the palp this species approaches the genus *Achelia*, but it differs from the typical species of that genus in the form of the proboscis



and in the abbreviation of the terminal segments of the palp. Of less importance is the absence of two characters included by Bouvier in his definition of *Achelia*, but by no means conspicuous in some species of that genus—namely, the prominence which bears the opening of the femoral cement-glands and that which carries the genital opening in the male sex. On the other hand, the form and position of the proboscis and the general aspect of the animal are quite those of *Austroraptus*, although it differs from both the other species in the number of palpal segments and the very compact form of the body.

*Austroraptus præcox*, sp. n. (Text-fig. 19).

*Occurrence*.—Station 220, off Cape Adare, 45–50 fathoms; 1 ♂ (Holotype).

*Description*.—*Body* compact, the lateral processes in contact at their bases, diverging a little distally; first intersegmental articulation distinct, second less so, third marked only by a groove. Cephalon nearly twice as wide as long, with a pair of spur-like antero-lateral tubercles. Ocular tubercle much taller than wide, inclined forward, conical apex above eyes nearly as long as basal part. Lateral processes each with a pair of conical dorsal tubercles, of which the posterior is the larger.

*Proboscis* directed obliquely downwards, not more than half as long as trunk, cylindrical in its basal half, then conical with a very narrowly truncate apex.

*Abdomen* elevated, sub-cylindrical, about half as long as trunk.

*Chelophores* with scape hardly longer than wide, with a pair of dorsal tubercles on

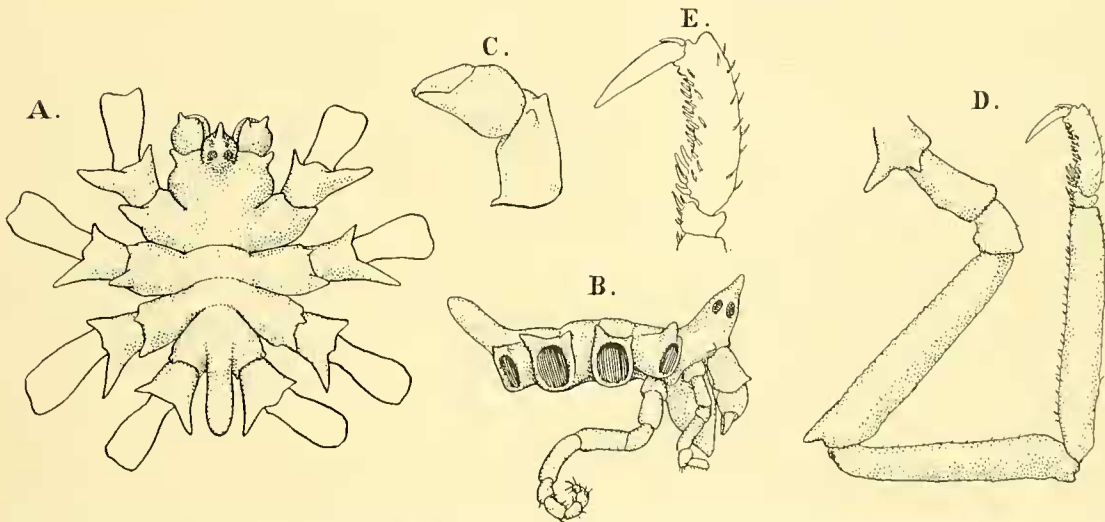


FIG. 19.—*Austroraptus præcox*, sp. n., Male. A. Dorsal view of body with chelophores and first and second coxæ. B. Lateral view of body with chelophore, palp, and oviger. C. Chelophore, further enlarged. D. Leg. E. Terminal part of leg.

its distal margin, the outer tubercle the larger. Chela completely formed, palm as long as broad and a little longer than the fingers, which are straight and meet along their length, crossing only at the very tips.

*Palps* and *Ovigers* shorter and stouter, but otherwise differing little from those of *A. polaris*.

*First coxa* with a pair of conical distal spurs, the posterior much the larger. Femur longer than first tibia, and subequal to second. Propodus more than three times as long as wide, rather more curved than in *A. polaris*, claw a little shorter, auxiliaries much as in that species.

Genital apertures distinct on second coxæ of last two pairs of legs.

*Measurements, in mm.*—

	Holotype.
	♂
Length of trunk . . . . .	1·75
Leg—	
First coxa . . . . .	·56
Second coxa . . . . .	1·0
Third coxa . . . . .	·52
Femur . . . . .	2·8
First tibia . . . . .	2·6
Second tibia . . . . .	2·8
Tarsus and propodus . . . . .	1·28
Auxiliaries . . . . .	·2

*Remarks.*—The presence of distinct genital apertures suggests that this specimen has attained fully adult characters, in which case the completely chelate form of the chelophores might justify its removal to another genus. In support of this view it may be pointed out that the chelæ, in having straight fingers meeting along their whole length, differ widely from the larval chelæ with their strongly arched fingers, described in the young specimen referred to *A. polaris* above. It is possible, of course, that this is merely an individual case of late persistence of larval characters, or, what is practically the same thing, of precocious development of the reproductive organs, as in the chelophore-bearing male of *Colossendeis gracilis*, described by Hoek (1881, p. 70), or the young specimens of *C. angusta*, mentioned by Meinert (1899, p. 59, Pl. v, fig. 21). Even if this be so, however, the species would seem to be distinguished from *A. polaris* by the condensed form of the body, with the lateral processes in contact at the base, and by the much shorter and stouter chelophores. From *A. juvenilis* it is distinguished not only by the segmentation of the palps, but by the longer auxiliary claws and other minor characters.

#### GENUS AUSTRODECUS, Hodgson.

##### *Austrodecus glaciale*, Hodgson (Text-fig. 20).

*A. glaciale*, Hodgson, 1907, p. 53, Pl. viii, fig. 1; Bouvier, 1913, p. 147, text-figs. 96 and 97.

*Occurrence.*—Station 220, off Cape Adare, 45–50 fathoms; 1 ♂, 1 ♀. Station 339, Entrance to McMurdo Sound, 140 fathoms; 1 ♂.

*Remarks.*—The specimens here recorded as males present one very conspicuous character not mentioned by Prof. Bouvier; this is the presence, on the underside of the femur of all the legs, of a prominent rounded process bearing at its tip the opening

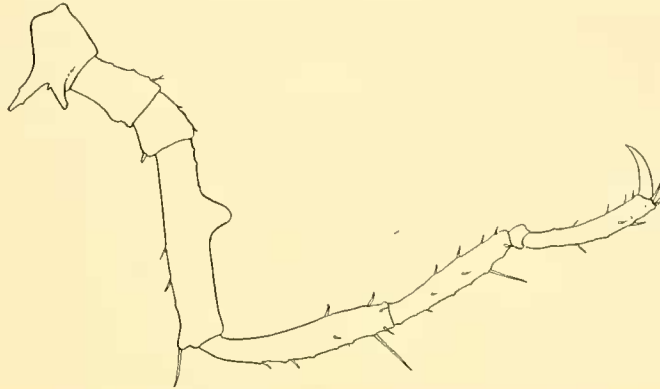


FIG. 20.—*Austrodecus glaciale*, Hodgson. Leg of Male showing prominence bearing opening of femoral cement-gland.

of the femoral cement-glands (Fig. 20). With Prof. Bouvier I have failed to demonstrate the sexual openings in the males, and with him also I have not been able to confirm Mr. Hodgson's statement that the female openings occur on the last pair of legs, although they are easily demonstrated on the first three pairs.

GENUS RHYNCHOTHORAX, Costa.

*Rhynchothorax australis*, Hodgson (Text-fig. 21).

*R. australis*, Hodgson, 1907, p. 57, Pl. viii, fig. 3; *id.*, 1914-15, p. 148.

*Occurrence.*—Station 294, Ross Sea, 158 fathoms; 1 ♂, 1 ♀.

*Remarks.*—This species, described from a single female specimen obtained by the "Discovery," has been taken in abundance by the "Gauss," and it is not necessary, therefore, to attempt to anticipate the fuller account that Mr. Hodgson will doubtless supply. It may be noted, however, that our two specimens do not show the difference that Hodgson finds to exist between the sexes as regards the approximation of the lateral processes. The palp (Fig. 21) consists of six segments (not five, as stated by Hodgson), a small but very distinct segment intervening between the basal one and that shown as succeeding it in the original figure. The terminal segment is a good deal larger than is shown in that figure, where it is partly concealed by the penultimate. The large spine on the third segment of the palp, which Dohrn designates "Kaudorn," is present in this species also, although far less strong than it is in *R. mediterraneus*.

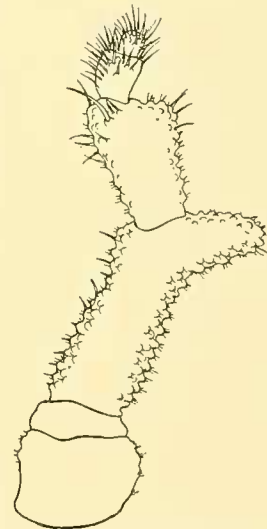


FIG. 21.—*Rhynchothorax australis*, Hodgson. Palp, from inner side.

In the male sex, the second coxa of the penultimate leg has the posterior corner, which bears the openings of the cement-glands, slightly produced as a round knob, in striking contrast to the long process found in this position in *R. mediterraneus*.

GENUS PYCNOGONUM, Brünnich.

*Pycnogonum gaini*, Bouvier (Text-fig. 22).

*P. gaini*, Bouvier, 1910, p. 30; *id.*, 1913, p. 156, text-figs. 101-104.

*Occurrence*.—Station 220, off Cape Adare, 45-50 fathoms; 1 young. Station 314, McMurdo Sound, 222-241 fathoms; 2 ♂. Station 338, Entrance to McMurdo Sound, 207 fathoms; 3 ♂, 1 ♀. Station 340, off Granite Harbour, 160 fathoms; 1 ♂. Station 355, McMurdo Sound, 300 fathoms; 1 ♀.

*Remarks*.—This species, described by Bouvier from a single female specimen, is also represented in the "Gauss" collection. The "Terra Nova" specimens from the Ross Sea area complete the record of circumpolar distribution for the species. They agree closely with Bouvier's account, and the largest is of nearly the same size as that described by him. It is not quite correct, however, to state that the species is "de beaucoup, la plus grande du genre *Pycnogonum*." Sars's and Norman's measurements and the evidence of specimens in this Museum show that *P. littorale* grows to a similar or even slightly greater size.

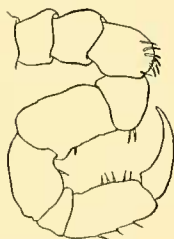


FIG. 22. — *Pycnogonum gaini*, Bouvier. Oviger of Male.

The ovigers of the male (Fig. 22) are composed of eight segments, excluding the terminal claw, in contrast to those of *P. littorale*, which have nine.\* The penultimate segment is very short, giving the terminal part of the oviger some resemblance to that of the walking legs, with which appendages the oviger also agrees in the total number of its segments.

\* Curiously enough Sars (1891, pp. 8 and 10, Pl. 1, fig. 1*g*) attributes only eight segments to the ovigers of *P. littorale*, and notes that they "have the same number of joints as the ambulatory legs." The ovigers of this species have been correctly described and figured by Hoek (1877, p. 237, Pl. xiv, fig. 1), and Wilson (1880 p. 469, Pl. 1, fig. 3*a*).

## IX.—LIST OF PAPERS REFERRED TO.

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