XXIII.—The Amphipoda of the Scottish National Antarctic Expedition.

By Chas. Chilton, M.A., D.Sc. (N.Z.), M.B., C.M. (Edin.), Hon. LL.D. (Aberd.), F.L.S.; Professor of Biology, Canterbury College, New Zealand. *Communicated by* Dr W. S. Bruce. (With Two Plates.)

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I. Introduction.

Shortly after my arrival in Britain in December 1911 I was honoured by a request from Dr W. S. Bruce, leader of the Scottish National Antarctic Expedition, that I would prepare a report on the Amphipoda collected during the voyage of the *Scotia*. Dr E. J. Allen, Director of the Marine Laboratory, Plymouth, very kindly offered me accommodation in the laboratory for the work, and free access to the library of the laboratory, which, fortunately, is very well supplied with works on the Crustacea. I was assured also of assistance from Mr T. V. Hodgson, the Curator of the Museum and Art Gallery, Plymouth, from Mrs E. W. Sexton, and from other friends; and accordingly I undertook the work. I received the main portion of the collection, contained in sixty-three bottles, on the 8th January 1912, and a few days later I received from Dr W. M. Tattersall of the Manchester Museum eighteen tubes containing additional Amphipoda found among the Schizopoda of the Scottish National Expedition which had been submitted to him for determination; these additional specimens contained three or four species not represented in the collection first received.

Twelve tubes of additional specimens from Dr Tattersall and many further specimens from the *Scotia* collection reached me in May. These consisted chiefly of duplicates of species previously sent, but contained also two species not previously seen. Some additions to the report, which had been sent in at the end of March, were therefore necessary.

With very few exceptions, the Amphipoda proved to have been particularly well preserved, and the localities, depth, and other particulars had been in all cases carefully recorded. I have given full details of these, even at the risk of some slight repetition, as they may prove to be of use in helping to decide questions now unforeseen that may afterwards arise. In several cases, especially among the Lysianassidæ, large numbers of specimens of various sizes had been collected from each locality, and these complete sets have been of very great use in helping me to ascertain the changes that take place in some species during the growth of the animal, and in determining the differences

between the sexes. I regret that the time at my disposal has been too short to allow of the complete examination of these series of specimens.

By far the greater part of the collection was made at the South Orkney Islands, mainly at Scotia Bay, Station 325, lat. 60° 43′ S., long. 44° 38′ W., the winter quarters of the *Scotia*. This appears to be a good collecting-ground for Amphipoda, particularly, of course, for the Lysianassidæ, and the forms obtained from this locality are extremely useful for comparison on the one hand with those obtained in 1882–83 by the German Transit of Venus Expedition from South Georgia, and on the other hand with the specimens collected by the French Antarctic Expedition from Port Charcot, Wandel Island, and other neighbouring localities. A few specimens were obtained from stations further south, at localities intermediate between Kerguelen Island and those already mentioned. Besides these, a small number of species was gathered at Gough Island, a locality from which very few Amphipoda had hitherto been described; others at the Falkland Islands; and some were obtained at Cape Town and Saldanha Bay in South Africa, and help to show the relation of the Amphipoda of South Africa to those of the various sub-Antarctic lands.

A few species were collected in the northern and tropical parts of the Atlantic on the voyage out and on the homeward voyage. As the greater part of the collection is from Antarctic and sub-Antarctic regions, I have kept these Atlantic species in a list by themselves, distinct from those gathered in the sub-Antarctic localities, under which I include Gough Island and South Africa.

As I was able to consult the reports on the Amphipoda of some of the Antarctic Expeditions, and already had some acquaintance with several of the sub-Antarctic species, it seemed a favourable opportunity for endeavouring to compare the results as far as possible, and to determine cases where the same species had been described under different names by different authors. In this effort I have been greatly assisted by the kindness of many friends. Dr G. Pfeffer and Dr O. Steinhaus of the Hamburg Museum very kindly placed at my disposal everything that I needed from the collections made at South Georgia by the German Expedition in 1882–83, and described by Dr Pfeffer in 1888; Monsieur Edouard Chevreux has sent me co-types of several of his species; from Mr A. O. Walker and from the British Museum I have had co-types of many of the species obtained by the *Southern Cross* and *Discovery* Expeditions, and described by Mr Walker; while the Rev. T. R. R. Stebbing and the authorities of the Vienna Museum have supplied still other specimens that have been extremely useful for comparison. Later on, when most of the work was completed, I was able, through the kindness of Dr W. T. Calman, to check my results by comparison with types and other specimens in the British Museum. At the same time, I have been able to see the Amphipoda collected by Sir E. Shackleton's British Antarctic Expedition in 1908–09, which had been placed in Mr Hodgson's hands; and in several cases I have been able to compare the *Scotia* specimens with New Zealand specimens that I had brought with me to England. To all those who have assisted me in these various ways I desire here to record my most grateful thanks.

It is a pleasure also to mention here my indebtedness to those who have assisted in other ways. I wish particularly to thank Dr E. J. ALLEN of the Marine Laboratory, Plymouth, for allowing me to make such free use of the facilities offered by the institution under his charge; without his assistance it would have been impossible to do the work in the time. Dr W. T. CALMAN of the British Museum, besides sending me co-types of species I required, has assisted me in the examination of others at the Museum itself and by his advice on many difficult points. Professor WOLTERECK of Leipzig and Dr A. BEHNING of the Zoological Station at Saratov have most obligingly communicated to me some of the results of their examination of the Amphipoda of the German South Polar and other Expeditions, which are as yet unpublished, though in the printer's hands. To Mrs E. W. SEXTON I am indebted for the loan of many papers and books that I required, for the keen interest which she has shown in the work during its progress, and for the great care and skill with which she has prepared the drawings of most of the figures for this paper.

In order to make clear the various references that will be given below, it may be well to state very briefly the growth of our knowledge of the Antarctic and sub-Antarctic Amphipoda. That knowledge dates back to the years 1839–40, when three expeditions—the British, French, and American—visited Antarctic seas. The British leader, Sir JAMES CLARKE ROSS, penetrated very far south in his memorable voyage, and during the expedition several Crustacea were collected, including some Amphipoda. No special report on these Amphipoda was published, but they appear to have been deposited in the British Museum, and several of them were afterwards described by SPENCE BATE and other writers. The Crustacea collected by the American Expedition were described by J. D. DANA in his well-known work, which forms one of the fundamental treatises for the study of the Crustacea. In it many Amphipoda are included. For many years after 1840 no further advance was made, and there is nothing noteworthy to be recorded until 1874, when several expeditions were sent out to southern seas for the observation of the Transit of Venus, and during these expeditions various collections were made. The Amphipoda of the British Expedition from Kerguelen Island were described by E. J. MIERS, and others collected by the American Expedition by S. I. SMITH. The French Expedition spent some time at the Campbell Island, and the Crustacea collected were afterwards described by HENRI FILHOL in the *Mission de l'Ile Campbell*, in which he also included a general list of the Crustacea of New Zealand. This report was not published till the year 1885, and in the meantime a beginning had been made with the study of the Crustacea of Australia and New Zealand by Professor W. A. HASWELL and Mr G. M. THOMSON respectively. During the years 1873 to 1876 the *Challenger* Expedition had made numerous collections in sub-Antarctic and a few in Antarctic seas, and these were most fully described and figured by the Rev. T. R. R. STEBBING in his elaborate report published in 1888. In the same year, but at a slightly earlier date, there was published a report by Dr G. PFEFFER on the Amphipoda collected at South Georgia by the German Transit of Venus Expedition of

1882–83. For some time after this no further contribution of any importance was made specially dealing with Antarctic Amphipoda, though those of some of the sub-Antarctic regions were gradually becoming better known. The next contribution to our knowledge of the Antarctic forms was made by the *Southern Cross* Expedition, which visited South Victoria Land in 1898–1900; the Amphipoda collected by this expedition were described by Mr A. O. WALKER in 1903.

Meanwhile, the Antarctic Expeditions of Britain, Germany, Sweden, and France had been wintering in the Antarctic and making numerous collections. The Amphipoda of the French Antarctic Expedition were described by Monsieur EDOUARD CHEVREUX in 1906, and those of the British by Mr A. O. WALKER in 1907. The reports on the German and Swedish Expeditions have not yet been published.

In 1907 a small scientific party from New Zealand visited the sub-Antarctic Islands lying to the south of that land, and the Crustacea collected were described by myself in 1909 in *The Sub-Antarctic Islands of New Zealand*, published by the Philosophical Institute of Canterbury.

A preliminary report on the Amphipoda of the recent French Expedition in the *Pourquoi Pas?* was published by M. CHEVREUX in 1911.*

From the lists given below it will be seen that the *Scotia* collection contained fifty-six species from Antarctic or sub-Antarctic seas and six Atlantic species. The great majority of these were already known, and I have made only nine new species and no new genus. This appears to show that the Amphipoda of the southern seas are becoming fairly well known so far as the mere identification of species is concerned, though there is much to be done in tracing out more completely the distribution of the species and any local varieties that they may present.

On the other hand, it may be noted from his preliminary report on the Amphipoda of the *Pourquoi Pas?* Expedition that M. CHEVREUX has established six new genera and numerous new species.

It will be seen that I have reduced a number of species to the rank of synonyms. I have done this only where there appeared to be good grounds for so doing, and in all cases where there is likelihood of a difference of opinion I have endeavoured to give my reasons in full. In thus reducing the number of described species, I have only continued a necessary work that has been commenced in recent years by other writers. In the earlier days of the study of the Amphipoda, when workers were few and collections scanty, it frequently happened that a collection from a new locality contained many new species. In numerous instances these were described on very meagre material, often from a single specimen; and even when there was an abundant supply of specimens time did not allow of the dissection of more than one or two, hence there

* M. CHEVREUX'S second paper (*Bull. Muséum Nat. Hist.*, 1912, No. 4), containing the diagnoses of the new species collected by this expedition, reached me when the final proofs of my paper had been corrected, and therefore too late for the results to be noticed here, though it is probable that one or two of the new species described below are identical with those established by M. CHEVREUX.

was little opportunity of distinguishing between characters subject to individual variation and those really common to the species. Consequently, when other specimens were obtained it was frequently found that they did not agree in all particulars with any of the species already described, and they were naturally considered to be new and were given a distinctive name. This practice was perhaps the safest at the time, and it was the more desirable when the specimens came from a new locality; but it unfortunately led to the idea that forms from fresh localities were almost necessarily new, and that the distribution of nearly all the species of Amphipoda was very limited. It also led to the introduction of long specific diagnoses, often containing characters of individual importance only. Naturally enough, specimens afterwards examined did not agree in all respects with these detailed descriptions, and thus a vicious circle was set up, leading to the continued establishment of new species, some of them being admittedly described in self-defence, and the fact that many species were widely distributed was long obscured.

As knowledge gradually increased it was found that in many cases the same species had been described under various names, and the preparation of a general survey of the whole group, such as that for *Das Tierreich*, necessarily led to a considerable reduction of species. From the example of a few species which were readily recognised, and hence known to occur at places widely remote from one another, it was found that some species at any rate were more widely distributed than had been originally supposed. Much assistance in clearing up difficulties was obtained from the detailed study by various authors of individual species and the consequent elucidation of the various forms that occur in some species and especially of the differences between the sexes and of the changes that take place during growth; and it is to further work of this kind that we must look for assistance in defining the limits of the different species.

Several of the species—or groups that I refer to under one specific name—are widely distributed in sub-Antarctic seas, and, as might be expected, the specimens from different localities now separate from one another are not always precisely the same, but show what may be considered local varieties. Some authors would doubtless prefer to call these local varieties species and give each a distinctive name; but this must necessarily lead to an indefinite multiplication of species, with ever-increasing difficulty of determining those already established, and as a matter of practical convenience it seems to me to be better at present to endeavour to recognise these widely distributed species and to leave the determination of their varieties until a larger number of forms from many localities have been studied.

In the list below I have indicated briefly the distribution of each species. From this it will be seen that an increasing number are now known to extend around the globe in sub-Antarctic seas, and that there is a greater resemblance between the Amphipodan faunas of South America, New Zealand, Australia, Kerguelen Island, and even South Africa, than appeared to be the case a few years ago. The importance of the facts on the question of the cause of this distribution cannot be discussed here. Another point made clear is that the number of species in northern seas represented by the same

or by a closely allied form in the southern is also shown to be increased. Leaving out of account the species known to be cosmopolitan, it has been long known that there were some species identical in Arctic and Antarctic seas, though practically unknown in the tropics; nearly every writer on Antarctic Amphipoda has identified one or more with northern species. It appears from examples like *Orchomenopsis chilensis* (Heller), and others that might be quoted, that in these examples of "bi-polar" species the species is not always entirely absent from the tropics, but exists there in deeper waters, while it can live near the surface in the colder regions; or that the tropical or temperate form is so much smaller than the polar one that it has usually been considered a separate species, and the existence of the species at intermediate localities has been overlooked. It appears that, for some reasons not altogether understood, many Amphipoda find their optimum environment near the Arctic and Antarctic regions, and exist there in greatest abundance, attaining a size far greater than that usual for similar forms in warmer seas. The difficulty of deciding whether these smaller forms are to be considered separate species or not is very great, and it must not be expected in the present state of our knowledge that logically uniform results can be arrived at. In some cases where the animal is abundant and specimens from many localities have been examined, we may be able to group them into one large species, while in other cases where only a few have been studied we are forced to leave them as separate small species. Unfortunately, this leaves the groups distinguished by specific names of very unequal value in the discussion of questions of distribution.

II. List of Species.

ANTARCTIC AND SUB-ANTARCTIC.

Name of Species.	Distribution and Remarks.
1. *Acontiostoma marionis* Stebbing.	Gough Island, Marion Island, Straits of Magellan, New Zealand.
2. *Amaryllis macrophthalma* Haswell.	Australia, South Africa, South America, New Zealand, Indian Ocean.
3. *Cyphocaris anonyx* Boeck.	Widely distributed in both northern and southern seas.
4. *Lysianassa cubensis* (Stebbing).	South Africa and Gulf of Mexico.
5. *Alicella scotiæ*, sp. nov.	South Atlantic; an allied species found in the North Atlantic.
6. *Cheirimedon femoratus* (Pfeffer).	South Orkneys, South Georgia, and Graham Land (Port Charcot).
7. *Tryphosa murrayi* Walker.	Off Coats Land and South Victoria Land.
8. *Tryphosites stebbingi* (Walker).	Off Coats Land and South Victoria Land.
9. *Orchomenella pinguides* Walker.	South Orkneys and South Victoria Land.
10. *Orchomenella macronyx* Chevreux.	South Orkneys and Graham Land (Port Charcot).
11. *Waldeckia zschauii* (Pfeffer).	Off Coats Land, Graham Land, and South Victoria Land.
12. *Orchomenopsis nodimanus* Walker.	South Orkneys and South Victoria Land.
13. *Orchomenopsis chilensis* (Heller).	In all seas, northern and southern.
14. *Orchomenopsis* (?) *coatsi*, sp. nov.	Off Coats Land.
15. *Harpinia oblusifrons* Stebbing.	Widely distributed in Antarctic and sub-Antarctic seas.
16. *Leucothoe spinicarpa* (Abildgaard).	In all seas.
17. *Amphilochus squamosus* G. M. Thomson.	South Orkneys, Marion Island, and New Zealand. Perhaps identical with *A. neapolitanus* of northern seas.

Name of Species.	Distribution and Remarks.
18. *Metopoides sarsii* (Pfeffer).	South Orkneys, South Georgia, and Graham Land (Port Charcot).
19. *Metopella ovata* (Stebbing).	South Orkneys, Straits of Magellan.
20. *Thaumatelson walkeri*, sp. nov.	South Orkneys. } An allied species at South Victoria Land.
21. *Thaumatelson inermis*, sp. nov.	South Orkneys. }
22. *Thaumatelson herdmani* Walker.	South Orkneys and South Victoria Land.
23. *Bircenna crassipes* (Chevreux).	South Orkneys and Graham Land (Port Charcot). A closely allied species occurs in New Zealand.
24. *Colomastix brazieri* Haswell.	South Orkneys and Australia.
25. *Liljeborgia dubia* (Haswell).	Widely distributed in southern seas.
26. *Epimeria macrodonta* Walker.	Off Coats Land and South Victoria Land.
27. *Pariphimedia integricauda* Chevreux.	South Orkneys and Graham Land (Wandel Island).
28. *Acanthonotozoma australis*, sp. nov.	Only one specimen known, from lat. 71° 22′ S., long. 16° 34′ W.; a deep-sea species (1410 fathoms).
29. *Leptamphopus novæ-zealandiæ* (G. M. Thomson).	Widely distributed in southern seas.
30. *Haliragoides australis*, sp. nov.	South Orkneys. A closely allied species in northern seas.
31. *Eusirus antarcticus* G. M. Thomson.	In all Antarctic seas. Perhaps identical with the northern *E. propinguus*.
32. *Eusirus splendidus*, sp. nov.	South Orkneys. Perhaps only a form of the preceding species.
33. *Eurymera monticulosa* Pfeffer.	South Orkneys, South Georgia, and Graham Land (Wandel Island).
34. *Bovallia monoculoides* (Haswell).	In all southern seas.
35. *Pontogeneia danai* (G. M. Thomson).	Falkland Islands, Australia, New Zealand.
36. *Pontogeneia antarctica* Chevreux.	South Orkneys, Graham Land, and the sub-Antarctic Islands of New Zealand.
37. *Atyloides magellanica* (Stebbing).	In all sub-Antarctic seas.
38. *Atyloides serraticauda* Stebbing.	In all sub-Antarctic seas.
39. *Atyloides calceolata*, sp. nov.	South Orkneys. Closely related to the preceding species.
40. *Paramœra austrina* (Bate).	A very abundant and variable species in sub-Antarctic and Antarctic seas.
41. *Djerboa furcipes* Chevreux.	South Orkneys and Graham Land.
42. *Paraceradocus miersii* (Pfeffer).	South Orkneys, South Georgia, and Graham Land.
43. *Mœra mastersii* (Haswell).	Widely distributed in the warmer southern seas.
44. *Paradexamine pacifica* (G. M. Thomson).	South Orkneys, Graham Land, and New Zealand.
45. *Polycheria antarctica* (Stebbing).	In all southern seas, and extending far to the north in the Indian and Pacific Oceans.
46. *Nototropis homochir* (Haswell).	Australia and South Africa. Closely allied to northern species.
47. *Talorchestia scutigerula* (Dana).	Falkland Islands and Tierra del Fuego.
48. *Hyale grandicornis* (Kröyer).	Gough Island and Chili. A closely allied species in New Zealand.
49. *Hyale saldanha*, sp. nov.	South Africa.
50. *Haplocheira barbimana* (G. M. Thomson).	In all southern seas.
51. (?) *Eurystheus afer* (Stebbing).	Gough Island, South Africa.
52. *Jassa falcata* (Montagu).	Widely distributed in northern and southern seas.
53. *Caprella æquilibra* Say.	South Africa. Very widely distributed.
54. *Hyperia gaudichaudii* Milne Edwards.	Falkland Islands, South Victoria Land.
55. *Vibilia antarctica* Stebbing.	In all southern seas.
56. *Euthemisto thomsoni* Stebbing.	In all southern seas.*

* The following additional species has been identified by the Rev. T. R. R. Stebbing from material sent to him:—*Lanceola æstiva* Stebbing, 1888, p. 1309, pl. cliii.; from Station 421.

NORTHERN AND TROPICAL ATLANTIC.

Name of Species.	Distribution and Remarks.
1. *Synopia schéeleana* Bovallius.	Pacific and Atlantic Oceans.
2. *Hyale grimaldii* Chevreux.	North Atlantic.
3. *Allorchestes plumicornis* (Heller).	Mediterranean and North Atlantic.
4. *Sunamphitoe pelagica* (Milne Edwards).	North Atlantic.
5. *Anchylomera blossevillii* Milne Edwards.	Tropical Atlantic.
6. *Oxycephalus clausi* Bovallius.	Tropical Atlantic and (?) Pacific.

III. Antarctic and sub-Antarctic Species.

Genus Acontiostoma Stebbing, 1888.

Acontiostoma marionis Stebbing.

1. *Acontiostoma marionis* Stebbing, 1888, p. 709, pl. xxx.*
   ,, ,, ,, 1906, p. 15, fig. 4.
   ,, *magellanicum* Stebbing, 1888, p. 714, pl. xxxi.
   ,, ,, ,, 1906, p. 15.

Station 461, Gough Island; 100 fathoms. 23rd April 1904. One specimen, 7 mm. long, 5 mm. high.

This specimen agrees well with the description and figures given by Stebbing. As I have only the single specimen, I have not dissected it, but the maxillipeds can be seen to agree with his description, while the shape of the third uropod and of the telson with its fringe of stout spines leaves no doubt as to the identity of the species.

A. magellanicum Stebbing is, as Mr Stebbing has pointed out, almost certainly the young of this species, which is now therefore known from Marion Island, Gough Island, and Straits of Magellan.

Among the Amphipoda that I brought with me from New Zealand for examination I have a slide from Mr G. M. Thomson's collection that undoubtedly belongs to this genus, and is, I think, not specifically distinct from *A. marionis*. It has the upper antennæ and the first gnathopod rather stouter than is shown in Mr Stebbing's figure; but the peculiar second gnathopod, with the finger sunk in a little cavity at the end of the propod, and the uropoda and telson, agree very closely with the *Challenger* specimen. In some points it approaches rather nearer to *A. magellanicum*, and tends to confirm the view that that species is only the young of *A. marionis*.

This slide was mounted by Mr Thomson from one of a very small number of specimens collected in Lyttelton Harbour by myself about the year 1884, and handed to him in 1895 when I left New Zealand for a lengthy period. When living, the animals, which were all of very small size, were bright red in colour. I had dissected and mounted a slide of one of the other specimens about that date, and I have a drawing

* The references are made by the year of publication to the works given in the Bibliography on pp. 517 and 518. I have given only those references that appeared to be necessary for the purpose of the present paper.

made at the time of the second gnathopod which closely corresponds with that given by STEBBING of the *Challenger* specimen.

Since this was written I have been able to compare Mr THOMSON'S slide with those of the *Challenger* specimens in the British Museum. The *Challenger* specimen of *A. marionis* is considerably larger than the New Zealand specimen, and, as stated above, has the first gnathopod more slender; but the differences are not, I think, of specific importance. The dissected parts of the small specimen of *A. magellanicum* are now so transparent that they are difficult to examine, but so far as they can be made out they seem to agree generally with *A. marionis*.

A. pepinii Stebbing, obtained by the *Challenger* at Kerguelen Island, was placed by Mr STEBBING in a new genus, *Stomacontion*, in 1899, and *A. kergueleni* Stebbing made a synonym of *A. pepinii*.

It seems, however, to be too near to *A. marionis* to be separated generically. Unfortunately, the very minute mouth parts do not show very clearly in Mr THOMSON'S prepared slide, and I cannot make out whether the first maxilla in it has the palp one- or two-jointed; but the palp of the maxillipeds certainly seems to have the fourth joint quite vestigial or absent, as described for *Stomacontion*; in *Acontiostoma* it is "very small." There seems to me to be no essential difference between the two genera in the third uropods.

Genus AMARYLLIS Haswell, 1880.

Amaryllis macrophthalma Haswell.

Amaryllis macrophthalmus and *A. brevicornis* Haswell, 1880A, p. 253, pl. viii. fig. 3, and p. 254.
„ *macrophthalma* Stebbing, 1888, p. 707, pl. xxix.
„ „ „ 1906, p. 24.
„ „ „ 1908, p. 67.
„ „ „ 1910A, pp. 569 and 633.
„ „ „ 1910B, p. 448.
„ „ Walker, 1909, p. 327.

Station 483, South Africa, entrance to Saldanha Bay; trawl, 25 fathoms. 21st May 1904. Five specimens, the largest 9 mm. long.

These specimens agree well with the short description given in *Das Tierreich*, and illustrate several of the points in STEBBING'S further description given in the reference quoted above, 1908, p. 67.

Another species, *A. bathycephala* Stebbing, has been described from Port Philip, Australia, and is evidently very closely allied, differing mainly in the side plate and basal joint of the third peræopod. In my specimens the hind lobe of the side plate is more produced downwards than in STEBBING'S figure of *A. macrophthalma*, and thus is a little more like *A. bathycephala*, but on the other hand the basal joint of the limb is expanded above instead of being narrowed as in the latter species.

The species is now known from Australia, South Africa, Straits of Magellan, and New Zealand, and Mr WALKER has recorded it from Wasin, British East Africa. In

1904 Mr WALKER added another species, *A. tenuipes*, from Ceylon, for which he established a new genus, *Vijaya*; but Mr STEBBING (1910A, p. 570) has pointed out that the difference in the male and female antennæ on which the genus was founded occurs also in *Amaryllis*, and that the new genus is therefore not required.

Genus CYPHOCARIS Lütken and Boeck, 1870.

Cyphocaris anonyx Boeck. (Pl. I. figs. 1–4.)

Cyphocaris anonyx Boeck, *Forh. Selsk. Christian.*, 1870, p. 104.
" " Stebbing, 1906, p. 29.
" " Walker, 1903A, p. 39, and 1903B, pp. 227 and 232.
" *micronyx* Stebbing, 1888, p. 656, pl. xii.
" " Chevreux, 1900, p. 164.

Station 414, lat. 71° 50′ S., long. 23° 30′ W.; 8 ft. vertical net, from the surface to 1000 fathoms. 15th March 1904. One specimen, total length 20 mm.

This specimen in all probability belongs to this species, although it differs from the description given in *Das Tierreich* in several minor points. The first segment of the peræon is more produced in front and much more acute than is shown in STEBBING's figure of the *Challenger* specimen; the antennæ have more numerous joints in the flagella; there is no accessory flagellum to be seen in either of the upper antennæ—possibly it has been broken off, though I can detect no trace of this. The first and second peræopods (fig. 3) are simple or almost so, the propod being only very slightly widened and the finger apparently not folding back upon it. The basal joints of the third to the fifth peræopods have the margins less serrated.

The gnathopods (figs. 1 and 2), the uropod, and the telson agree fairly well with *C. anonyx*, which has been already recorded from Tristan da Cunha in the South Atlantic, and I think the *Scotia* specimen is only a larger and more fully developed specimen of that species. The whole integument is soft, there is no sign of eyes, and the animal was probably taken at a considerable depth. It is interesting to note that in 1903 Mr WALKER stated that this species would probably be found to occur in Antarctic seas. It is also found in the seas of the northern hemisphere.

Genus LYSIANASSA Milne Edwards, 1830.

Lysianassa cubensis (Stebbing). (Pl. I. fig. 5.)

Lysianax cubensis Stebbing, 1897, p. 29, pl. vii.B.
Lysianassa cubensis Stebbing, 1906, p. 38.

Station 478, South Africa, Cape Town, Coaling Jetty No. 1. 14th May 1904. Two specimens, the larger a female 13 mm. long.

Station 483, South Africa, entrance to Saldanha Bay; trawl, 25 fathoms. 21st May 1904. Two specimens, one a male 8 mm.

These agree well with the descriptions and figures given by STEBBING, except that the larger ones contain rather more joints in the flagella of the two antennæ. In the second antenna of the male the flagellum is long, about two-thirds the length of the animal, and the last joint of the peduncle is longer than the preceding joint, which is rather short. In the second maxilla the inner lobe is specially broad and has the inner margin pretty strongly convex. The second gnathopod has the palm a little projecting so as to approach towards the chelate character. The uropods agree well with the description; the character of the peduncle of third uropod seems fairly characteristic, and is shown in fig. 5. Its outer margin is produced upwards into a vertical flange above the general body of the joint; it curves upwards at the end into a subacute point, and bears three short spinules on the distal half of the upper margin. The two branches are similar in shape, both tapering to the extremity; the outer is slightly longer than the inner, and bears a few long hairs at a little distance from the end.

The species was originally described from specimens in the Copenhagen Museum, coming from the Gulf of Mexico.

Genus ALICELLA Chevreux, 1899.

Alicella scotiæ, sp. nov. (Pl. I. figs. 6 and 7.)

Station 468, South Atlantic, lat. 39° 48′ S., long. 2° 33′ E.; 2645 fathoms. 29th April 1904. One specimen, 20 mm. long.

Integument soft, the body greatly swollen about the middle, tapering considerably posteriorly. The hinder half of the body somewhat compressed, with a slight dorsal ridge, but hardly carinate. Side plates 1–4 increasing in depth, the fourth with its posterior lobe extending about one-third along the fifth, which is shallower than the fourth and broader than deep. Lateral plate of the first pleon segment angular in front but rounded behind, its lower border fringed with long setæ; that of the second segment with both angles rounded; the third with the anterior rounded, posterior angle quadrate, both bearing plumose setæ on the lower margin. Sides of the third segment of the urus upraised alongside the telson. Eyes indistinct, apparently forming a narrow crescentic band along the lateral sides of the head.

Antennæ slender, first shorter than the second, about as long as the head and the first segment of the peræon, the first joint short and thick, as long as the second and third together, the third very short; flagellum of about twenty joints, the first as long as the next five and supplied on the inner side with dense tufts of long setæ, similar setæ being present also on a few of the succeeding joints. Accessory flagellum nearly half as long as primary; of six joints the first as long as the next two.

Second antenna with third joint well exposed; the fourth with long, rather stout setules on the lower margin; fifth slightly longer than the fourth, with long slender setæ on lower margin; flagellum many-jointed, of about thirty-five joints, all except the more distal ones bearing a small tuft of long setæ at the lower distal angle.

First gnathopod (fig. 6) moderately stout; basal joint stout, of equal width throughout; a few tufts of long setæ near the distal end of its posterior margin; ischium, merus, and carpus all short, subequal, and all bearing long setæ on the posterior margin; carpus also with tuft at the antero-distal angle; propod at base as wide as the distal end of the carpus, narrowing slightly distally; anterior margin straight or slightly curved, and with tufts of long setæ; posterior margin slightly concave distally, and bearing numerous long setæ in tufts; the palm transverse, straight, defined by two long spinules; finger long, extending beyond the palm.

Second gnathopod (fig. 7) slender; basal joint curved; ischium much longer than the merus; carpus longer than the propod, which is narrowed at base, slightly curved; palm rather short and slightly oblique; the posterior margin of the merus is furred and bears three tufts of long setæ towards the distal end; carpus furred on both margins, with tufts of long setæ on the lateral surface and anterior margin at distal end, and several tufts, or short transverse rows, on the distal half of the posterior margin; propod with both margins furred, and tufts of long setæ on their distal portions, those on the anterior border towards the base of the finger forming a dense group of very long setæ. The first and second peræopoda rather slender; the merus slightly broadened and produced at the antero-distal angle; propod somewhat curved; finger about half as long as the propod, slender, curved, smooth. The third, fourth, and fifth peræopoda are of increasing lengths, all having the merus much broadened and produced, the propod curved, and the finger long, as in the first and second peræopoda; basal joint of all expanded, that of the third rounded posteriorly, those of the fourth and fifth somewhat angled below, and with the posterior margin convex in its upper part and straight or slightly concave below, the hind margins feebly crenulate.

First uropods with the branches slender, subequal, longer than the peduncle, marginal spines on the peduncle and on the outer branch. Third uropod with peduncle large, shorter than the branches, which are subequal in length, lanceolate, margins fringed with short spinules and long plumose hairs, the inner branch with small second joint. Telson reaching nearly to the end of the third uropod, apparently without spines on its dorsal surface.

This species differs from the typical species *A. gigantea* Chevreux in having both gnathopoda subchelate and the first not slender but moderately stout. As there are only the two species known, it will be well to slightly widen the characters of the genus to include the species now being described. The typical species was of enormous size, one of the specimens being as much as 140 mm. long; probably when specimens of both species of an intermediate size are known, it will be found that the two are more nearly alike than appears from the detailed description above, which is based on the single specimen obtained by the *Scotia*.

Genus CHEIRIMEDON Stebbing, 1888.

Cheirimedon femoratus (Pfeffer).

Anonyx femoratus Pfeffer, 1888, p. 93, pl. ii. fig. 2.
Cheirimedon dentimanus Chevreux, 1905, p. 159, and 1906B, p. 2, figs. 1–4.

South Orkneys, Brown's Bay, Station 326A. November 1903. Many specimens of about 10 mm. in length.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One small specimen.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom, clumps of weeds; temperature 29°·1. 3rd December 1903. Two specimens.

These specimens agree minutely with the figures and description given by CHEVREUX, and I have been able to compare them with co-types of his species which he has been good enough to send me. I have also compared them with a specimen of *Anonyx femoratus* Pfeffer from South Georgia, kindly placed at my disposal by the authorities of the Hamburg Museum, and I find it is quite the same as the South Orkneys specimens and those from Port Charcot sent to me by Monsieur E. CHEVREUX. Pfeffer's description agrees well with *C. dentimanus*, but his figure shows the telson too broadly rounded posteriorly and the cleft too shallow. The figure was, however, made without dissecting the specimen. His name has priority by many years. M. CHEVREUX states that this species appears to closely resemble *C. fougneri* Walker from South Victoria Land. I have been able to examine co-types of this species from the British Museum, and also specimens obtained by the *Nimrod* Expedition, and find that, though there is considerable resemblance in general structure, *C. fougneri* differs considerably from *C. dentimanus* in the greater length of the antennæ, and also in having the body much less compact, and the first gnathopod more slender.

Genus TRYPHOSA Boeck, 1871.

Tryphosa murrayi Walker.

Tryphosa murrayi Walker 1903A, p. 50, pl. ix. figs. 45–51.
„ „ „ 1907, p. 16 (part).

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. Many specimens, the largest 22 mm. long.

After much consideration, I have decided to record these specimens under the name given above. I have been able to compare them with the type of Mr WALKER's species obtained by the *Southern Cross* Expedition, and the two agree so closely that they must be considered specifically identical. The eyes are obsolete, the lateral lobes of the head produced and acute or subacute, the hind margin of the third pleon segment straight,

and the first segment of the urus bears a well-marked triangular carina. The appendages are in close agreement with those of the type, and in both the inner lobe of the first maxilla bears four setæ instead of two as given in the diagnosis of the genus in *Das Tierreich Amphipoda*, two of the setæ being shorter than the others.

While it is easy to identify the *Scotia* specimens with Mr WALKER'S type, the position is not so clear if we try to go a little further. In the *Southern Cross* Amphipoda Mr WALKER described another species, *Tryphosa adarei*, differing from *T. murrayi* in certain minor characters which appeared at the time to be of specific importance. In 1907, however, on the receipt of numerous other specimens from the *Discovery* Expedition, he united the two species under the name *T. murrayi*, as the examination of the specimens showed that the characters at first relied upon were subject to variation. In this he was perhaps right, but a comparison of his specimens of *T. adarei* with my specimens shows that they differ from them as they do from *T. murrayi* in having the first gnathopod rather stouter towards the distal end, and particularly in having the carpus stouter and rather shorter than the propod, while in *T. murrayi* it is as long as or longer than the propod ; though the differences are not great, they appear to be constant in the specimens I have examined. Moreover, Mr WALKER states that *T. adarei* closely resembles *T. barbatipes* Stebbing, but differs in the proportions of the joints of the upper antennæ and of the gnathopoda. Before comparing the *Scotia* specimens with *T. murrayi* Walker I had also noted their great similarity to *T. barbatipes*, except in the shape of the first gnathopods, and comparison of the three shows that *T. adarei* is largely intermediate in this character between *T. murrayi* and *T. barbatipes*, so that, if the first two are united, it will be necessary to unite them both with *T. barbatipes*. This species is, however, now placed by STEBBING in another genus, *Tryphosella*, and the shape of the first gnathopod in the type specimen of *T. barbatipes* which I have also examined is considerably different from that of *T. murrayi*, the carpus being shorter and the propod longer and stouter and slightly different in outline, as may be seen from an examination of the figure in the *Challenger* Report, and there are differences in some other characters. It is quite likely that an examination of specimens from other localities will show complete transitional forms, but at present I cannot go fully into this question, and in the meantime prefer to identify my specimens with *T. murrayi* and to leave that species distinct from *T. adarei* and from *T. barbatipes*. In all three species the side plates of the first and second gnathopoda have a small tooth at the posterior angle. It is to be hoped that a complete revision of this group will be made before long ; such a revision must, however, include the similar forms from northern seas, some of which appear to be very closely allied.

Tryphosa murrayi is known from South Victoria Land and from near Coats Land, though not yet recorded from intermediate localities.

Genus TRYPHOSITES G. O. Sars, 1891.

Tryphosites stebbingi (Walker).

Hoplonyx stebbingi Walker, 1903A, p. 52, pl. ix. figs. 52 to 57.
Tmetonyx stebbingi Stebbing, 1906, p. 720.
„ „ Chilton, 1909A, p. 618.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. Many specimens, about 17 mm. long.

I have compared these specimens with those from the *Southern Cross* Expedition on which Mr WALKER established the species, and find that they agree closely in all points, except that the lateral process of the head might almost be called acute instead of "point rounded"—in some of the *Southern Cross* specimens it is almost or quite as acute as in the *Scotia* specimens. The first segment of the urus is slightly compressed, but hardly sufficiently so to be called carinate. The eyes are very indistinct or absent completely. The first gnathopod has the propod slightly narrowed towards the distal end, with the palm short and not well defined; in one specimen the palm was found to be rather oblique on one side of the body, while on the other it was almost transverse; the dactyl has a prominent secondary nail. In this specimen the second uropod had the inner branch somewhat constricted towards the distal end, as shown by STEBBING for *Tryphosa cicadoides* (1888, pl. iv. fig. ur_2); the telson is long and narrow, without marginal spinules, but with two small spinules in the emargination at the end of each lobe.

The species appears to be close to *T. cicadoides* Stebbing, one of the chief differences being apparently in the shape of the telson; but it is to be noted that the drawings of the telson of the two specimens represented on plates iv. and v. of the *Challenger* Report differ to some extent.

The species was described by WALKER under the genus *Hoplonyx*, and compared with *H. kergueleni* (Miers), which is now placed under *Tryphosa*, the genus to which *T. cicadoides* was first assigned. *Tryphosa kergueleni* is certainly not unlike *Tmetonyx stebbingi*, but differs in the points mentioned by WALKER, and particularly in having the propod of the first gnathopod stouter and with the palm regularly rather oblique. The first gnathopod of *Tryphosa trigonica*, as figured in the *Challenger* Report, is more like that of *T. stebbingi*, and in describing that species Mr STEBBING suggested that it was perhaps the young of *T. kergueleni* (Miers).

In the *Scotia* specimens, and also in those collected by the *Southern Cross*, the epistome is produced anteriorly into an acute process as in *Tryphosites longipes* (Bate and Westwood), and the species must be placed in the same genus, though the differences between *Tryphosa*, *Tmetonyx*, and *Tryphosites* are very trifling. *Tryphosites stebbingi* appears to be very close to *T. longipes* of northern seas, differing chiefly in having the peræopoda shorter and stouter and the eyes indistinct.

Tmetonyx stebbingi is now known from South Victoria Land and from Coats Land, and I have recorded a form from the sub-Antarctic islands of New Zealand which appears to belong to this species, but is much smaller, has well-developed eyes, and is darkly pigmented (1909A, p. 618).

Genus ORCHOMENELLA.

Orchomenella pinguides Walker.

Orchomenella pinguides Walker 1903A, p. 46, pl. viii. figs. 24–30.
" " " 1907, p. 13.

South Orkneys, Scotia Bay, Station 325. 2nd January 1904. Several specimens.

These specimens undoubtedly belong to this species, as on comparison I find that they agree closely with co-types of WALKER's species kindly sent me by Dr CALMAN of the British Museum. They show also a pretty close resemblance to *Cheirimedon dentimanus* Chevreux, but differ in having the eyes not black (in spirit specimens), and in having the first gnathopod less strongly developed and the palm not concave; the third segment of the pleon has the posterior angle rather more rounded, and the telson appears slightly more elongated than in CHEVREUX's species. I have also been able to examine specimens of *O. pinguides* from South Victoria Land collected by the *Nimrod* in 1908, and can detect no difference between them and the South Orkneys specimens. In most of the *Nimrod* specimens the eye is colourless in spirit and appears to have been red in the living animal; some of the specimens were labelled "Red Amphipods," and the specimens preserved in formalin still show the red colour of the eyes and a slight pinkish tinge of the whole body. On the other hand, WALKER in describing his species says: "Eyes moderately large, dark, oval, expanded below." There thus appears to be some variation in the eyes of *Orchomenella pinguides*, for in the co-types from the British Museum one specimen has an eye still fairly darkly coloured, but in the others it is pale, as in the South Orkneys specimens, and I have noticed also some variation in the *Nimrod* specimens.

Orchomenella macronyx Chevreux.

Orchomenella macronyx Chevreux 1905, p. 161, fig. 2.
" " " 1906B, p. 8, figs. 5–7.

South Orkneys, Scotia Bay, Station 325. May 1903. Two specimens, 4·5 mm. long.

These two small specimens on the whole agree well with CHEVREUX's description, especially in the shape of the last segment of the pleon and the first of the urus. The eye is rather narrower and less oval, and the first gnathopod appears to have a slightly more transverse palm, against which the finger fits closely without projecting beyond it. The telson is concave above.

Genus WALDECKIA Chevreux, 1906
(= CHARCOTIA Chevreux, 1905, name preoccupied).

Waldeckia zschauii (Pfeffer).

Anonyx zschauii Pfeffer, 1888, p. 87, fig. 1.
Orchomenopsis zschauii Stebbing, 1906, p. 85 (part).
Charcotia obesa Chevreux, 1905, p. 163, fig. 3.
Waldeckia obesa Chevreux, 1906B, p. 15, figs. 8–10.
„ „ Walker, 1907, p. 10, pl. ii. fig. 4.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. 12th March 1904. Many specimens, the largest 16 mm. long.

Although I have been unable to examine specimens of *Anonyx zschauii* Pfeffer, as those described by him did not belong to the official collection of the German Expedition of 1882–83, and consequently were not deposited in the Hamburg Museum, I feel confident that my specimens must be referred to his species. His description of the great obesity of the body, and particularly of the dorsal process on the first segment of the urus, which is so distinct from that of other species with which it might otherwise be confused, leaves no doubt upon the subject. In this species, in place of the more or less rounded prominence on the first segment of the urus, the process rises abruptly behind the usual depression into a sharp tooth, from which it slopes downwards towards the next segment; this is shown clearly also in PFEFFER's figure, although the figure is rather small. Mr STEBBING in 1906 referred his species *Orchomene cavimanus* to PFEFFER's species, but an examination of the mounted slides of the *Challenger* collection in the British Museum shows that the first gnathopod of *O. cavimanus* has the propod broad and not narrowing distally as in *W. zschauii*, and, judging from the description, the process on the urus does not appear the same as in that species, and it appears to me that *O. cavimanus* Stebbing is more properly referred to the widespread and variable species *O. chilensis* (Heller); see p. 474, where the question is further discussed.

I did not at first compare my specimens with the descriptions of *Waldeckia obesa* Chevreux, but the shape of the basal joint of the third peræopod in one of the slides I had mounted proved to be so similar to the figures given by both CHEVREUX and WALKER that a full comparison was made, with the result that my specimens proved to be identical with that species also. The figures given by CHEVREUX and WALKER show the great obesity of the body and the great prolongation backwards of the fourth side plates better than PFEFFER's; but, on the other hand, they hardly show so well the character of the process on the urus, though from their descriptions it seems evident that they were dealing with the same structure.

I have compared the *Scotia* specimens with those collected by the *Discovery* and referred to this species by Mr WALKER, and find no essential difference; in the *Discovery* specimens the third segment of the pleon is slightly more compressed and elevated into a blunt dorsal tooth, while the tooth on the first segment of the urus is a little shorter than in the *Scotia* specimens.

WALKER's figure is taken from a male specimen, and shows the long second antennæ found in that sex; these are longer than in the males of *Orchomenopsis chilensis* (Heller) and some other allied species. The occurrence of some specimens with long lower antennæ was pointed out by PFEFFER in his original description.

Whether it was necessary to establish the new genus *Waldeckia* for this species appears to me to be doubtful, but as that has been done I am referring the species to it. As mentioned above, STEBBING in his *Tierreich Amphipoda* placed the species under *Orchomenopsis*, and the affinities of the species seem to me to be distinctly with species of that genus such as *O. chilensis* (Heller) and *O. nodimanus* Walker. It is true that CHEVREUX has described the propod of the first gnathopod of *W. obesa* as being simple and not subchelate; but in my specimens, although the propod narrows very considerably distally, there is a distinct though short palm, and this is shown also in the figures given by PFEFFER and WALKER. Moreover, there are considerable differences in the breadth of the propod in other species of *Orchomenopsis*, as will be seen from my discussion of *O. chilensis* (Heller); and in the South African specimens which I refer to that species the propod narrows distally in the same way, though not to the same extent, as in *W. zschauii*.

The other important point in which *Waldeckia* differs from *Orchomenopsis*, as first pointed out by CHEVREUX, is in the possession of finger-like accessory branchiæ. CHEVREUX describes one of these as being present on all the legs, and two on the fourth. In the specimens I examined I found them on the fourth, fifth, and sixth legs only, and only one on the fourth. They appear to arise either from or near the base of the branchia. They are long and finger-like in shape, but seem to differ in internal structure from the branchia, being filled with granules or globules of some kind, and whether they are really branchial in function is perhaps doubtful. This, however, is neither the time nor the place for a discussion of their physiological importance; the question that concerns us now is their presence or absence, and their value when present as a generic character.

Secondary or accessory branchiæ have been described in several genera of the Amphipoda belonging to quite different families, and it seems probable that they may be independently developed in cases where there is special need for them, and that their presence is not of great taxonomic importance. For example, they occur in some species of *Hyalella* and not in others, and the species in which they occur are nevertheless retained under the genus *Hyalella*. It was not till after I had written down the general considerations given above that I had an opportunity of specially looking for accessory branchiæ in other allied species; but afterwards, on examining large specimens of *Orchomenopsis chilensis* Heller (= *O. rossii* Walker), from Station 411, whence the *Waldeckia zschauii* had been obtained, I found them in that species also, though they appear to be present only on the fifth and sixth legs. Unfortunately, my attention was not specially directed to this question till it was too late to make an examination of other specimens, but the facts detailed above show, I think, that *Waldeckia* is nearer to *Orchomenopsis* than might appear at first sight.

The small amount of difference between some of these genera, and the difficulty of referring a species to its proper genus, is shown by the fact that while CHEVREUX established for the species in question the new genus *Waldeckia*, and compared it with *Menigrates* and *Lepidepecreum*, Mr WALKER, who was independently working at the same species, had at first classified it under *Socarnes*, and Mr STEBBING has since stated that he would have been inclined to concur in this view. Mr STEBBING has, however, now accepted the genus *Waldeckia*, and has described a new species, *W. chevreuxi*, from Australia (1910A, p. 572, pl. xlvii.B). This species, which, though undescribed, has been long known to me from New Zealand, differs from *W. zschauii* (Pfeffer) in having the first gnathopod quite simple, and thus offers an additional reason for retaining the genus *Waldeckia*, unless indeed *W. chevreuxi* could not have been as appropriately placed under one of the existing genera.

Genus ORCHOMENOPSIS Sars, 1893.

Orchomenopsis nodimanus Walker.

Orchomenopsis nodimanus Walker, 1903A, p. 44, pl. vii. figs. 13–17.
„ „ Stebbing, 1906, p. 721.

South Orkneys, Scotia Bay, Station 325; trap. Many specimens, averaging about 15 mm.

South Orkneys, Scotia Bay; 10 fathoms. March 1903. Three specimens, the largest 13 mm.

South Orkneys, Scotia Bay; 9–10 fathoms. April 1903. One specimen.

Also taken at other times along with *O. chilensis* (Heller).

These specimens agree well with the description given by WALKER, and I have been able to compare them with co-types of his species from the British Museum, and find no essential difference between the specimens from the South Orkneys and those from South Victoria Land. The species in most respects is very similar to *O. chilensis* (Heller), but can be distinguished by the slight carination of the hinder part of the body and by the peculiar structure of the propod of the first gnathopod; in most of my specimens this is a little stouter than is shown in WALKER'S figure, and it bears a tubercle on the posterior surface as described by him.

This species occurred along with *O. chilensis* (Heller) in many captures.

Orchomenopsis chilensis (Heller).

Anonyx chilensis Heller, 1865, p. 129, pl. xi. fig. 5.
Orchomenopsis obtusa Sars, 1891 and 1895, p. 74, pl. xxvi. fig. 2, and p. 684.
Orchomene musculosus Stebbing, 1888, p. 673, pl. xx.
(?) „ *abyssorum* Stebbing, 1888, p. 676, pl. xxi.
(?) „ *cavimanus* Stebbing, 1888, p. 679, pl. xxii.
Orchomenopsis musculosa and (?) *abyssorum* Stebbing, 1906, p. 84.
(?) „ *zschauii* Stebbing (part), 1906, p. 85.

Orchomenopsis proxima Chevreux, 1903, p. 93, fig. 6*a–c*, and 1906B, p. 13.
„ *rossii* Walker, 1903A, p. 45, figs. 18–23, and 1907, p. 14.
(?) „ *abyssorum* Walker, 1903B, pp. 224 and 227.
(?) „ „ Chevreux, 1903, p. 92.

South Orkneys, Scotia Bay, Station 325 ; trap, 15 fathoms. May 1903. Several hundred specimens up to 15 mm. in length, all "taken from trap in one day ; bait—penguin." Taken along with *O. nodimanus.*

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W. ; 161 fathoms. 12th March 1904. Many specimens, most of them of large size, about 20 mm.

South Orkneys, Station 325 ; 21 fathoms. September 1903. "Through hole in ice made for seal skeleton." Many hundreds of specimens of varying size up to 15 mm. Taken along with *O. nodimanus.*

South Orkneys, Station 325 ; 13–25 fathoms. August 1903. Many specimens ; *O. nodimanus* being taken at the same time.

South Orkneys, Scotia Bay ; 9–10 fathoms. May 1903. Many specimens ; also taken along with *O. nodimanus.*

South Orkneys, Station 325 ; 27 fathoms ; temperature 29°. June 1903. Many specimens ; *O. nodimanus* being taken at the same time.

In order to make clear the discussion of this species it will be well to give the following historic account. The genus *Orchomenopsis* was established by SARS in 1893 for the species *O. obtusa.* In 1888 Mr STEBBING had described three species under the genus *Orchomene*, namely :—*Orchomene musculosus*, described from one specimen about 12 mm. long, taken near the south of Japan ; *Orchomene abyssorum*, from the Atlantic, east of Buenos Aires, 1100 fathoms, one specimen, male ; and *O. cavimanus*, from Kerguelen Island, two or three specimens, the one described being 12 mm. long. Of these species SARS included the first two, and with some doubt also the third, in his genus *Orchomenopsis.* Many years before this, however, in 1865, HELLER had described the species *Anonyx chilensis* from Chili, and in his revision of the Amphipoda for *Das Tierreich* STEBBING puts the whole of his three species under *Orchomenopsis*, giving *Anonyx chilensis* Heller as a doubtful synonym of *O. abyssorum*, and identifying his species *O. cavimanus* with *Anonyx zschauii* Pfeffer, which had been described from South Georgia in 1888. In 1903 CHEVREUX described *Orchomenopsis proxima* from specimens obtained from deep waters in the tropical Atlantic Ocean, at the same time identifying other specimens from the Northern Atlantic with *O. abyssorum*, and describing a new species, *O. excavata*, which he stated comes close to *O. cavimanus* (Stebbing). In 1906 he identified specimens obtained by the French Antarctic Expedition from Graham Land with *O. proxima*, pointing out a few small differences between the specimens from the two localities, and stating that the species was very close to *O. obtusa* Sars. Meanwhile, in 1903, WALKER had described *O. rossii* from Cape Adare, also referring to its close resemblance to *O. obtusa* ; in 1907 he examined many specimens obtained from South Victoria Land by the *Discovery* Expedition, and

modified his original description in one or two points in which he found that the additional specimens showed some slight variation from those at first described. In 1903 he also had identified as *O. abyssorum* specimens obtained from the Atlantic by the *Oceana*.

The *Scotia* collections contain an enormous number of specimens from the various localities given above, and a comparison of these with co-types of WALKER's species showed that they were the same as the forms described by him under the name *O. rossii*. A comparison of the different specimens from the South Orkneys and other *Scotia* localities with co-types of WALKER's species supplied by the British Museum, and with specimens collected by the *Nimrod* Expedition, showed that the species varied greatly not only in size but also in several points which had been relied upon by previous authors for the description of different species—for example, in the second gnathopod, some of the specimens having the palm strictly transverse, while in others it was slightly produced so as to give the gnathopod almost a chelate character; in the postero-lateral angle to the third pleon, which in some is quadrate and in others more or less broadly rounded; and in the proportions of the two branches of the third uropods. There are, of course, also differences between the sexes, the males having the lower antenna considerably longer than the females, and having the branches of the third uropod supplied with more numerous long plumose setæ, though some similar setæ are present in the female. An examination of young forms appears to show that these setæ are only developed to the full extent in older specimens, there being fewer in younger forms.

I was able also to compare these specimens with a specimen of *O. proxima* Chevreux from Port Charcot, kindly sent to me by Monsieur CHEVREUX, and I have come to the conclusion that this species is the same as *O. rossii*, the differences which M. CHEVREUX points out being accounted for by the variations mentioned above. In the character of the eyes and in other points it is quite the same as a specimen of *O. rossii* of moderate size; on the other hand, as M. CHEVREUX points out, it is considerably larger than the forms from the North Atlantic on which he originally described the species *O. proxima*. From the Vienna Museum I obtained specimens of *Anonyx chilensis* Heller, taken by the *Novara* at Chili. This proved to be about half the size of *O. proxima*; it differs a little in the shape of the eye and in the somewhat smaller size of the rounded prominence on the first segment of the urus, but in all other points I can find nothing to distinguish it from *O. rossii* Walker. In *Anonyx chilensis* the eye is almost oval, widening slightly below, and it is colourless in the spirit specimens and probably was red in the living animal, as described by SARS in *O. obtusa*. In large specimens of *O. rossii* from Antarctic regions, the eye usually differs somewhat in shape, being much narrower above and wider below, and in most of them it is dark in colour in spirit specimens, though in many, and especially in forms preserved originally in formalin, there is still a reddish tinge to be seen. Moreover, even in the Antarctic specimens there is some variation in the size, shape, and colour of the eyes, and consequently I do not think this slight difference sufficient to distinguish *Anonyx chilensis*

Heller from *O. rossii* Walker. Monsieur CHEVREUX had also kindly sent me a specimen of *O. obtusa* Sars from Norway, and an examination of this showed that in size and in all essential characters it was identical with the specimens of *Anonyx chilensis* Heller, though the eye was less oval and more widened below, and hence more like the specimens of *O. rossii*. Consequently I am forced to the conclusion that *O. obtusa* Sars also belongs to this widely distributed species. *O. musculosa* Stebbing was described from a single specimen obtained from the south of Japan, and from the description given I think there can be no doubt that it is the same as the other forms already described. *O. abyssorum* Stebbing is supposed to be distinguished from the other species mainly by the more strictly chelate character of the second gnathopod, and the figure of the *Challenger* specimen shows the palm much more produced than it is in any of the forms I have already referred to, though, as I have pointed out, there is considerable difference among them in this character. In all other points there seems little to distinguish *O. abyssorum* from the others, and, as mentioned above, STEBBING has already given *Anonyx chilensis* Heller as a possible synonym of this species, although the second gnathopod in that form can hardly be described as truly chelate.

For some considerable time I was inclined to think that perhaps it would be wise to keep *O. abyssorum* as a separate species; however, after having finished my examination of the forms already mentioned, I found in the *Scotia* collection a number of specimens from Saldanha Bay in South Africa which in most points are quite similar to *O. rossii*, but in which the second gnathopod has the palm so much produced that it could quite strictly be called chelate, as in *O. abyssorum* Stebbing.

If this form had agreed in other points with STEBBING's *O. abyssorum* it would confirm the opinion that this is a distinct species; but this is not the case, for the first gnathopod, instead of having the basos slender and the propod rather broad, as in the type specimen, is somewhat stouter than usual, and differs also in having the propod considerably narrowed distally, so that its palm is much shorter.* In it the eyes are black, usually oval, though slightly widening below, and they vary in size and in the amount of widening at the lower part. After careful consideration I think it best to include this form also in the same species as the others, although they might perhaps be looked upon as different variety, though not corresponding in all points with the form described as *O. abyssorum* by STEBBING.

If all these forms are combined they must be known under the name of *Orchomenopsis chilensis* Heller, as that name has priority by many years. With regard to *O. cavimanus* Stebbing, from the Kerguelen Islands, STEBBING himself has identified it with *O. zschauii* (Pfeffer); but, as I have shown elsewhere, PFEFFER'S species is quite distinct in the shape of the dorsal process on the urus and in the greater stoutness of the body and the character of the first gnathopod, and has been since redescribed by CHEVREUX under the name *Waldeckia obesa*.

* In the stout basos and in the character of the propod the first gnathopod in these specimens shows considerable approach to *O. nodimanus* Walker, but it lacks the tubercle present in that species.

I have examined a mounted slide of *O. cavimanus* Stebbing in the British Museum. The palm of the second gnathopod is hardly so oblique as shown in the figure of the whole appendage in the *Challenger* Report, but is distinctly concave, the finger impinging against a rather narrow projection of the propod and being thus separated from the rest of the palm. This structure seems rather more marked in the one gnathopod than in the other of the same specimen, and the difference from typical specimens of *O. chilensis* is not greater than, or indeed so great as, that of the specimens from South Africa mentioned above, and the other parts of the specimen seem to agree well with that species. In the same way, *O. excavata* Chevreux, from the Atlantic, might perhaps also be looked upon as only a form of the widespread *O. chilensis* Heller, but I have not been able to examine specimens of *O. excavata*.

ORCHOMENOPSIS (?) COATSI, sp. nov. (Pl. I. figs. 8–9.)

Station 411, Coats Land, lat. 71° 1′ S., long. 22° W.; 161 fathoms. 12th March 1904. Many specimens, about 13 mm. long.

In general possessing the characters of an *Orchomenopsis*, but differing markedly in the first gnathopoda (fig. 8), which are long and very slender. The basos is long, slender, but expanding at the middle so as to be elongate fusiform; the ischium is fully half as long as the basos; merus shorter; carpus about as long as the ischium, slender; propod longer than the carpus but not broader, narrow, oblong, about four times as long as broad; palm a little oblique; small tufts of setæ on the propod toward the distal end.

The second gnathopod (fig. 9) is of the form normally found in the genus; the carpus is expanded so that the posterior margin is strongly convex, both margins being furred; the propod is much shorter than the carpus, narrowed at the base; palm short, transverse or a little projecting; the margins of the propod are furred, and supplied with long setæ in the usual manner.

Remarks.—The first gnathopoda of this species differ so much from those of other species of *Orchomenopsis* that it should perhaps be classed in some other genus, but I cannot find any genus that seems more appropriate, for in all the other characters it is closely similar to a typical species such as *O. chilensis*, and I therefore prefer to place it provisionally under *Orchomenopsis* rather than to add another genus to the Lysianassidæ.

Genus HARPINIA Boeck, 1871.

Harpinia obtusifrons Stebbing.

Harpinia obtusifrons Stebbing, 1888, p. 820, pl. lvi., and 1906, p. 143.
„ „ Walker, 1907, p. 17.
„ „ Chilton, 1909A, p. 619.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One female, 4 mm. long; another female (from Scotia Bay), 7 mm.

These specimens resemble those examined by me from Campbell Island, and differ from the description of the genus as given by STEBBING in *Das Tierreich Amphipoda* in having the eye present and formed of many facets, though it is pale in colour in the smaller specimen.

The species is widely distributed in Antarctic and sub-Antarctic seas.

Genus LEUCOTHOE Leach, 1813–14.

Leucothoe spinicarpa (Abildgaard).

Gammarus spinicarpus Abildgaard, 1789, in O. F. Muller, *Zool. Dan.*, 3rd ed., vol. iii. p. 66, pl. cxix. figs. 1–4.
Leucothoe antarctica Pfeffer, 1888, p. 13, pl. ii. fig. 4.
" *spinicarpa* Stebbing, 1906, p. 165.
" " Walker, 1907, p. 18.
" *commensalis* Haswell, 1880, p. 261, pl. x. fig. 3.
" " Stebbing, 1906, p. 166.
" " " 1910A, p. 580 and p. 630.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April 1903. One specimen, 8 mm. long.

I have been able to compare this specimen with some obtained at South Victoria Land by the *Nimrod*, and with specimens from Plymouth, England, and I agree with Mr WALKER that there is no appreciable difference between them and the European species. The South Orkneys specimen has the conical process on the propod at the base of the finger a little more obtuse than in the others, but in all other points they agree.

With regard to *L. commensalis* Haswell, Mr STEBBING says: "It is perhaps only a matter of taste or convenience whether this should be taken as a distinct species or as a variety of *L. spinicarpa* Abildg." In my South Orkneys specimen the propod of the second gnathopod contracts a little more towards the finger hinge than is shown in SARS' figure of the European form, as it does in the Australian specimens examined by Mr STEBBING; on the other hand, the tuberculation of the palm is practically intermediate between that shown by SARS and by HASWELL, and the resemblance throughout is so very close that I see no good object in retaining a different name for the Australian specimens.

Three other species are at present included in the list of Australian Crustacea, viz. *L. brevidigitata* Miers, *L. diemenensis* Haswell, and *L. gracilis* Haswell; but, as STEBBING points out, it is probable that they should all be included in *L. spinicarpa*, though, as yet, I have not been able to examine specimens. I have, however, examined the type of *L. antarctica* Pfeffer from the Hamburg Museum, and find that it also belongs to this cosmopolitan species.

I may take this opportunity of stating that I have recently (1912, p. 129) united *L. tridens* Stebbing, obtained in New Zealand waters by the *Challenger*, with the

earlier described *L. traillii* G. M. Thomson, as the small differences given in the descriptions were found not to hold for all specimens or to be based on misconceptions. It is not unlikely that this species will also prove to be only a form of *L. spinicarpa* Abildg.

Genus Amphilochus Bate, 1862.

Amphilochus squamosus G. M. Thomson.

Amphilochus squamosus G. M. Thomson, 1880, p. 4, pl. i. fig. 4.
" *marionis* Stebbing, 1888, p. 743, pl. xxxviii.
" " " 1906, p. 151 and p. 723.
" " Walker, 1901, p. 300.

South Orkneys, Scotia Bay, Station 325. Several specimens, all of small size, about 3 mm. long.

These specimens certainly agree with Stebbing's species described from Marion Island, but they are also the same as the species previously described by Thomson under the name *Amphilochus squamosus*, from New Zealand. This latter species, which has been accidentally omitted from the list in *Das Tierreich Amphipoda*, is fairly common in New Zealand, and I have long noted that it is very closely allied to the *Challenger* species, and the present opportunity of examining specimens from another locality that undoubtedly belong to Stebbing's species confirms this. The New Zealand specimens are usually covered with dark, reddish-black spots, and some of the South Orkneys specimens still show signs of similar coloration. Mr Thomson described a small accessory flagellum on the first antenna, and, though this does not appear to have been noted by others in this genus, which is described in *Das Tierreich* as being " without accessory flagellum," it is undoubtedly present also in the South Orkneys specimens. Walker has pointed out that *A. neapolitanus* Della Valle, 1893, is perhaps the same as *A. marionis*; in describing his species Stebbing originally compared it to *A. tenuimanus* Boeck. It will probably be found to be either the same as or very closely allied to one of the northern species. Mr Thomson's name has priority over all except *A. manudens* Bate and *A. tenuimanus* Boeck.

Genus Metopoides Della Valle, 1893.

Metopoides sarsii (Pfeffer). (Pl. I. fig. 10.)

Metopa sarsii Pfeffer, 1888, p. 84, pl. ii. figs. 3, 8, and pl. iii. fig. 2.
Metopoides walkeri Chevreux, 1906A, p. 37, fig. 1; 1906B, p. 28, figs. 15–17.

South Orkneys, Scotia Bay, Station 325; shore pools; temperature 30°–32°. 6th December 1903. Eight specimens, the largest measuring 7 mm. in length in the usual position with the pleon folded under the peræon.

In the collection of Amphipoda in the Hamburg Museum there is a single specimen

of *Metopa sarsii* Pfeffer. This specimen I have been allowed to dissect and mount permanently as a micro-slide, and I find it agrees precisely with *M. walkeri* Chevreux, a name which must therefore be dropped in favour of the older *M. sarsii*.

My specimens agree minutely with CHEVREUX's description; the accessory flagellum is, I think, present in all the specimens, but it is exceedingly small, so small that it would hardly be inaccurate to say that it is absent. CHEVREUX describes the palp of the mandible as two-jointed; I think there is a minute third joint present in the specimen from which I dissected the mouth parts, but if so it is almost as small as the accessory flagellum; yet the presence or absence of these minute joints is one of the distinguishing marks for some of the genera into which the family Metopidæ is now divided.

CHEVREUX was unable to identify his species with any of those described by STEBBING in the *Challenger* Report, but says it seems to be nearest to *Metopa ovata*; but this species has the basal joints of peræopods four and five narrow, and is now placed in the genus *Metopella*. I would rather be inclined to compare it to *M. magellanica* or *M. compacta*, species now placed in the genus *Metopoides*, while the small acute teeth which are present on the palm of the second gnathopod, as described by CHEVREUX, show an approach to the more irregular palm found in *M. crenatipalma*, a species now known as *Proboloides crenatipalma*.

From the *Challenger* collections STEBBING described six species of *Metopa*—one from Kerguelen Island, the other five from Cape Virgins, off Patagonia; each of which, with one exception, was represented by one specimen only, though of one species another specimen was found at Nightingale Island in the Tristan da Cunha group. Of these six species three are placed in *Das Tierreich Amphipoda* under *Metopoides*, two under *Metopella*, and the other under *Proboloides*. As these genera are separated from one another and from *Metopa* by small points such as those I have mentioned above, and as there are altogether twenty-one species of *Metopa*, six of *Metopella*, three of *Metopoides*, and seven of *Proboloides*, it is not to be wondered at that the classification of the family is admittedly in an unsatisfactory condition, and I think it wisest not to attempt to identify the species under consideration with any of the *Challenger* species, although it is probably the same as one of the species described from Cape Virgins.

The sides of the last segment of the urus are raised into a vertical plate on each side of the telson, and this is continued by a similar vertical plate on the outer edge of the peduncle of the third uropod, so that a groove is formed, protected on each side by these vertical plates or flanges, in which the telson may rest when the animal swims by backward strokes of the hinder part of the body (see Plate I. fig. 10).

Genus METOPELLA G. O. Sars, 1892.

Metopella ovata (Stebbing).

Metopa ovata Stebbing, 1888, p. 764, pl. xlii.
" " " 1906, p. 183.

South Orkneys, Scotia Bay, Station 325A; dredge, 2–8 fathoms; temperature 29°–30°. 6th December 1903. Several specimens, none exceeding 3 mm. in length.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April 1903. Three small specimens.

Several of these are females bearing eggs, and none can be said to be certainly males. These specimens agree closely with the description given by STEBBING, and have the basal joints of the fourth and fifth peræopods narrowed as given in the diagnosis of the genus. The gnathopods, uropods, and telson are all in close agreement with the figures given in the *Challenger* Report; the accessory flagellum on the upper antenna is present, though extremely small, being about the same size as in *Metopoides sarsii* Pfeffer. The palp of the mandible is short, and consists of a very short first joint, an expanded second joint bearing three setæ along one margin, and a very short third joint tipped by a setum.

Genus THAUMATELSON Walker, 1906.

This genus was established by WALKER in 1907 for his species *T. herdmani* obtained by the *Discovery* Expedition. The *Scotia* obtained several specimens from the South Orkneys of what appear to be two additional species of the same genus. The genus is mainly characterised by the very peculiar telson, which was described by WALKER as "large, entire, oval, and set in a vertical plane on its longer edge." The telson in the two species I have now to describe agrees well with this description. The shape of the telson is probably associated with the extremely large side plates which cover all the appendages when these are withdrawn, and enclose the animal so that it looks like a small bivalve shell; when this is done the pleon is folded in under the side plates which appear to overlap the telson all except a small thicker ridge along its dorsal margin, which fills the small slit between the right and left side plates.

In the mouth parts the genus agrees well with the characters of the family Metopidæ; one species, however, is peculiar in having the second gnathopod chelate.

Thaumatelson walkeri, sp. nov. (Pl. I. figs. 11–15.)

South Orkneys, Scotia Bay, Station 325. April and May 1903. Several specimens, the largest 3 mm. in length.

Specific Description.—In general characters (see fig. 11) similar to *T. herdmani*, but with the side plates even larger, the fourth segment being longer than any of the others

and having an extremely large side plate. The second and third pleon segments not produced into a postero-dorsal tooth, but the third bearing a stout conical tooth projecting at right angles to the dorsal surface of the segment. The first antenna has the first joint much larger than the second or third, and produced at the upper margin into a broad, hood-like process; a minute accessory flagellum is present.

Further Description.—The antennæ (fig. 12) are quite short, the upper one being slightly longer than the lower. It has its basal joint very stout, and is produced above at the distal end into a broad process overlapping the second and nearly as long. The second joint is slightly broader than the third, which is about the same length. The flagellum tapers gradually, and consists of about thirteen joints, all with very few setæ. There is a small accessory appendage.

In the second antenna the last joint of the peduncle is slightly longer and more slender than the preceding; the flagellum is of about the same length as the peduncle, and contains about ten joints.

The mandibles have the same general shape as in *Metopa*; the palp, though small, is less vestigial than in some of the other genera of the family; the first joint is short, the second moderately long and broad, and the third is about as long as the first. There is no molar process. The first maxilla has the palp two-jointed. In the second maxilla the outer lobe is rather longer and broader than the inner. Both these maxillæ, and also the maxillipeds, have the same general character as in the next species, *T. inermis*.

The first gnathopod (fig. 13) has the basos long, widening a little distally; the merus is rather longer than the ischium, and ends in a rounded lobe bearing three long setæ, the posterior margin being furred; the carpus is about half as long as the propod, and is produced posteriorly into a short lobe fringed with setæ; the propod sub-oblong, about twice as long as broad, with anterior margin rather strongly convex; the palm oblique, straight, and defined by stout spinules.

The second gnathopod (fig. 14) is similar in general structure, but is longer; the ischium is not produced into a lobe; the carpus is shorter, but has the lobe longer; and the propod is longer, being considerably more than twice as long as broad.

The peræopoda are slender, and bear only a few short setæ.

The segments of the urus (fig. 15) cannot be made out distinctly, and appear more or less completely fused; the uropoda are long and slender, and bear few setæ; the first uropod reaches beyond the others, and has the peduncle longer than the subequal branches; in the second uropod the peduncle is about the same length as the equal branches; the third has the peduncle slightly longer than the basal joint of the single branch. The telson is flattened so as to form a vertical plate, and has a slight thickening along the dorsal margin.

When the side plates are folded together the strong tooth on the third pleon segment projects backwards, and the whole animal looks very like an Ostracod, some of which were found along with it, having been at first sorted out along with specimens of this species.

Thaumatelson inermis, sp. nov. (Pl. I. figs. 16 and 17.) *

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. April and May 1903. Several specimens, the largest 3 mm. long.

Specific Description.—Very similar to *T. herdmani* Walker, but differing in having the second gnathopod long and chelate, the propod being produced into a long acute process as long as half the whole propod, the fixed finger finely pectinate and fitting closely against the dactyl, which has its inner margin furnished with small, widely separated serrations.

Further Description.—The form described above is the female, several of the specimens examined bearing eggs. The lateral angle of the head is rather acute; and in the shape of the body, the proportions of the segments and of the side plates, the species closely resembles *T. herdmani*. The eye is fairly large, round, and colourless in spirit, having been probably red in the living animal. In the first antenna the first joint is large and produced at its upper distal angle, though to a slightly less extent than in *T. walkeri*, and I can find no accessory flagellum. In other respects the antenna is similar to that of *T. herdmani*, and the joints of the flagellum bear long sensory setæ. In the lower antenna the last joint of the peduncle is about as long as the preceding, and the flagellum is of the same length. The mandible has the palp small, the first joint is short, the second moderately long, the third small and slender, the cutting edge and other parts having the character common to the family. The first maxilla has the palp two-jointed, its extremity furnished with four or five small spinules and one or two longer setæ; the inner lobe is rounded at the end, and bears three or four setæ; the outer lobe bears several stout spinules and one or two longer setæ, and has its inner margin furred. The second maxilla is of the ordinary form.

The maxillipeds have the inner lobes separate, rounded at the end, and bearing two rather large setæ. The outer lobe is small, being merely a slight extension of the joint as in *Metapoides sarsii*. The palp is similar to that in *T. herdmani*.

The first gnathopod (fig. 16) has the side plate undeveloped; in general shape it is similar to that of *T. herdmani*, but has both the merus and the carpus produced posteriorly into a lobe tipped with long setæ, the process of the merus reaching to the end of that of the carpus. The propod is rather large, and is slightly distended at the palm, which is nearly transverse and is defined by three or four stout spinules.

The second gnathopod (fig. 17) has the basal joints similar to those of *T. herdmani*, but is chelate, as already described. The peræopoda are long, very slender, and bear few setæ or spinules. The side plates of the fourth pair are particularly large, and cover up the fifth, sixth, and seventh pairs, the side plates of which are not developed and the basal joints slender. The first uropod extends considerably beyond the second; the branches are subequal, shorter than the peduncle. The second uropod is short, but extends beyond the third and a little beyond the telson; its branches are subequal.

* This species is perhaps the same as *Thaumatelson nasutum* Chevreux (*Bull. Muséum Hist. Nat.*, 1912, No. 4, p. 5), though the descriptions of the mandibular palp do not agree.

The third uropod reaches a little beyond the peduncle of the second; its single branch is about as long as the peduncle, but rather more slender, and bears a minute second joint. The telson reaches slightly beyond the third uropod, is greatly flattened vertically, and has the dorsal border somewhat thickened, as described in *T. walkeri*.

In many respects this species shows close approximation to *T. herdmani*, described by Mr WALKER, from South Victoria Land, but is clearly distinguished by the large chelate second gnathopod. This may, however, ultimately prove to be a sexual character.

Thaumatelson herdmani Walker.

Thaumatelson herdmani Walker, 1906, p. 15, and 1907, p. 21, pl. vii. fig. 11.

South Orkneys, Scotia Bay, Station 325. 1903. A few specimens.

After I had drawn up the description of the preceding species, with the remarks thereon, I found in the "residues" of some collections made during 1903 both additional specimens of that species and also others with subchelate second gnathopoda agreeing in all respects with *T. herdmani* Walker, so that that species also does occur at Scotia Bay. I can find very little difference between the two except in the second gnathopoda, and, as stated above, strongly suspect that both forms belong to the same species; but the additional specimens came into my hands too late to allow of the question being fully investigated.

Genus BIRCENNA Chilton, 1884.

Bircenna crassipes (Chevreux).

Wandelia crassipes Chevreux, 1906A, p. 87, figs. 1 and 2.
" " " 1906B, p. 45, figs. 24–26.
Bircenna crassipes Chilton, 1909B, p. 62.

South Orkneys, Scotia Bay, Station 325; dredge, 9–10 fathoms. May 1903. One specimen, 2 mm. long.

This small specimen agrees very closely with CHEVREUX's description and figures.

The species is very close to *B. fulva* Chilton from New Zealand, and differs from it only in the longer and more slender gnathopods, and in having the branches of the first and second uropods equal and shorter in proportion to the peduncles.

Kuria longimana Walker and Scott (1903, p. 228), from the Indian Ocean, appears to be nearest ally of the genus *Bircenna*.

Genus COLOMASTIX E. Grube, 1861.

Colomastix brazieri Haswell.

Colomastix brazieri Haswell, 1880, p. 341, pl. xxii. fig. 4.
" " Stebbing, 1906, p. 206.

South Orkneys, Scotia Bay, Station 325. 1903. Two small females, the larger 3·5 mm. long.

These specimens certainly belong to this genus, and probably to HASWELL's species;

but as they are both females of small size, and perhaps not fully mature, the identification is not free from doubt. They agree generally with the description of the species in *Das Tierreich Amphipoda*, but appear to differ in the following points :—

The upper antenna is rather longer and stouter than the lower ; the flagellum is very small, and consists of one short joint and two, or perhaps three, very minute ones.

The lower antenna has the fifth joint of the peduncle a little longer than the fourth, and both considerably longer than the third ; the flagellum consists of one small joint, followed by one or more very minute ones. There are no serrations to be seen on the lower antenna, the animal in this point agreeing with the description.

The mouth parts were not examined.

The first gnathopod is long and slender, agreeing well with the description.

The second gnathopod has the carpus as long, and at distal end as broad, as the propod. The inner branch of the third uropod scarcely reaches beyond the extremity of the preceding uropods ; its upper margin is minutely serrulate ; the outer branch is more slender, and is about two-thirds as long. Very minute serrulations are present on the inner branches of the first and second uropods also.

The telson apparently agrees with the description, but could not be fully examined.

It is perhaps doubtful if this species is really distinct from *C. pusilla* (Grube), from the North Atlantic and the Mediterranean, but the *Scotia* specimens appear to differ from it in the proportions of the joints of the lower antenna, and in the absence of serrations on the peduncle. On the other hand, the second gnathopods and the uropods agree quite as well, or perhaps better, with *C. pusilla* than with *C. brazieri*. Another species, *C. hamifera* Kossmann, has been recorded from the Red Sea, but is thought to be probably an immature male of *C. pusilla*. All the three species were combined under the name *C. pusilla* by Della Valle in 1893.

C. brazieri was described from the east coast of Australia. I have taken a specimen in Otago Harbour, New Zealand, that probably belongs to the same species ; in the living animal the eye was red as in *C. pusilla*.

Genus Liljeborgia Bate, 1862.

Liljeborgia dubia (Haswell).

Eusirus dubius Haswell, 1880, p. 331, pl. xx. fig. 3.
Liljeborgia dubia Stebbing, 1906, p. 233, 1910A, p. 638, and 1910B, p. 454.
„ „ Walker, 1907, p. 35.
„ „ Chilton, 1909A, p. 619.

South Orkneys, Scotia Bay, Station 325 ; dredge, 9–10 fathoms. June 1903. One imperfect specimen, anterior half of body only ; the length of the whole animal would be fully 15 mm.

This fragment seems to belong, without doubt, to this species ; it agrees in the peduncles of the antennæ and in the narrower basal joints of the third to fifth

peræopods. In these characters it differs from *L. consanguinea*, which has been taken off South Africa and at Kerguelen and Heard Islands.

Another species, *L. æquabilis*, described by STEBBING, 1910A, pp. 588 and 638, from Australian seas, seems to be closely allied, and all three species present many points of resemblance to *L. fissicornis* (Sars), found in the Arctic and North Atlantic Oceans.

L. dubia is now known from Australia, New Zealand, South Victoria Land, the South Orkneys, and South Africa.

From Mangareva Island, Gambier Archipelago, M. CHEVREUX has described a species, *L. proxima*, 3 mm. long, which is, he says, very near to *L. pallida* (Sp. Bate) and *L. brevicornis* (Bruzelius). It seems also to be very close to *L. dubia* or to *L. æquabilis*, the latter of which is, according to STEBBING, in close agreement with *L. brevicornis*.

Genus EPIMERIA.

Epimeria macrodonta Walker.

Epimeria macrodonta Walker, 1906, p. 16, and 1907, p. 24, pl. viii. fig. 14.

Coats Land, Station 411; trap, 161 fathoms; lat. 74° 1′ S., long. 22° W. 10th March 1904. One specimen, 25 mm. long.

This specimen must, I think, undoubtedly belong to WALKER's species, but it differs a little in the arrangement of some of the numerous teeth. The first segment of the peræon has a short dorsal tooth and a small lateral tooth; there are no teeth on the short second segment; the other segments of the peræon and those of the pleon bear dorsal and lateral teeth as described by WALKER. The first segment of the urus bears a strong dorsal tooth as described, but on the second segment there is a tooth placed a little laterally on each side on the posterior margin, and there is a lateral carina ending in sharp teeth on the third segment. The first joint of the peduncle of the first antenna bears a long tooth on the under side at the extremity, in addition to the two lateral teeth; the inner tooth on the second joint is much longer than the outer one. The eye is large, round, and projects as a hemisphere from the side of the head; in the spirit specimen it is yellowish in colour.

This species seems to come near to *E. loricata* Sars, which is widely distributed in northern seas, and appears to differ only in the arrangement of the teeth on the pleon and urus, and in the acuteness of the dorsal teeth—points which are probably subject to variation.

Mr WALKER's specimens were from the Winter Quarters of the *Discovery* in M'Murdo Strait, South Victoria Land.

Genus PARIPHIMEDIA Chevreux, 1906.

Pariphimedia integricauda Chevreux.

Pariphimedia integricauda Chevreux, 1906A, p. 39, fig. 25, and 1906B, p. 39, figs. 21–23.

South Orkneys, Scotia Bay, Station 325; shore pools. 4th February 1904. Temperature 32°–35°. One specimen, 13 mm. long.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom and clumps of weed. 3rd December 1903. Temperature 29°·1. One specimen, 11 mm. long.

These specimens agree well with M. CHEVREUX's description and figures so far as the external characters are concerned. I have not examined the mouth parts in detail.

His specimens were obtained at Wandel Island.

Genus ACANTHONOTOZOMA Boeck, 1876.

Acanthonotozoma australis, sp. nov. (Pl. II. fig. 19.)

Scotia, 18th March 1904. Lat. 71° 22′ S., long. 16° 34′ W.; 1410 fathoms. Station 417. One female specimen; length of body (head to base of telson), 35 mm.

Head and anterior six segments of peræon dorsally rounded; last segment of peræon, the three segments of pleon, and first of urus dorsally carinate. On the first four of these the carina forms a large tooth produced acutely backwards; on the first segment of the urus it is confined to the posterior half of the segment, and is preceded by a slight notch, the whole of the portion in front of which is folded under the preceding segment when the body is fully extended. The carina itself is convex anteriorly, and produced backwards into a very acute point (fig. 19).

Head broad, dorsally convex, curving slightly downwards in front, and ending in a short acute rostrum reaching about half way to end of first segment of upper antenna; lateral margin with a short subacute process below the upper antenna, and with the lower margin produced anteriorly into a rounded process and separated from the rest of the head by a slight furrow.

First side plate produced anteriorly, with anterior angle rounded and posterior angle quadrate; second, anterior angle rounded, posterior subacute; third, much deeper than first and second, posterior angle produced, almost acute; fourth, posterior angle produced acutely inferiorly, the posterior process between the two emarginations subacute; fifth, anterior lobe regularly round, posterior lobe a little deeper, acute, and with a groove below for basal joint of peræopod; sixth, similar, but with anterior lobe smaller and concealed by the fifth side plate; seventh, small and rounded. Lower border of first pleon segment rounded below, the second with lower margin straight and posterior angle produced acutely; both with an oblique ridge running towards the posterior angle. Third segment similar to the second segment, but without ridge.

Eyes completely absent. Upper antennæ reaching considerably beyond peduncle of lower. First joint of peduncle very stout, produced at inner upper angle into a long acute spine reaching beyond the end of second joint, and with a blunter and shorter spine on under outer side; second joint produced into subacute spine on the outer side; third joint with small spines on the outer and inner sides, the outer one tipped with setæ, flagellum longer than peduncle, rather stout, especially towards base, and having some of the basal joints slightly produced below and bearing the sensory setæ.

Lower antennæ as long as head and first five segments of peræon; last joint of peduncle somewhat compressed laterally, longer than preceding, which is slightly keeled above and produced at the extremity.

First gnathopod simple, fairly stout; carpus much broader and longer than propod; the lower margin of merus, carpus, and propod spinose. Second gnathopod similar to first in size and form.

First and second peræopods longer than gnathopods and somewhat slender. Third peræopod much longer than second, its basal joint narrow, with ridge running down the middle of outer side; propod much longer than carpus. Fourth peræopod similar to third, but considerably longer; lower posterior angle of basal joint quadrate and not produced. Fifth peræopod much longer than the fourth; basal joint broader, produced posteriorly at upper part into a rounded lobe below which the margin is deeply concave; postero-inferior angle produced into an acute point reaching almost as far as the end of the ischium.

First uropod with base much longer than the subequal branches and grooved above; branches narrow-lanceolate, ending acutely, the outer one folded in under the inner.

Second uropod similar, but with peduncle as long as inner branch; the outer branch not much more than half the length of inner. Third uropod with peduncle very short, produced above on outer margin into an acute spine which reaches as far as the end of the telson; the two branches subequal, narrow-lanceolate, flat, the outer one folded under the inner. Telson flat, laminar, scarcely narrowed, emarginate posteriorly.

On the whole, this species seems to come fairly well under *Acanthonotozoma*, though it would not be difficult to find points in which it does not quite fit the generic description. Both gnathopoda are simple, but the first is neither slender nor feeble. The mouth parts have not been examined in detail, but do not appear especially drawn out for piercing; the palp of the mandible is slender, that of the maxilliped is small and slender, and shorter than the very large outer plate, which is much larger than the inner plate.

Genus Leptamphopus G. O. Sars, 1893.

Leptamphopus novæ-zealandiæ (G. M. Thomson).

Pherusa novæ-zealandiæ G. M. Thomson, 1879, p. 239, pl. x.c, figs. 2, 2*a–c*.
Panoplœa debilis G. M. Thomson, 1880, p. 3, pl. i. fig. 3.
Oradarea longimana Walker, 1903a, pp. 40 and 56, pl. x. figs. 77–89.

Oradarea longimana Walker, 1907, p. 32.
„ „ Chevreux, 1906B, p. 54.
Leptamphopus novæ-zealandiæ Stebbing, 1906, pp. 294 and 727.
„ „ Chilton, 1909A, p. 621.

South Orkneys, Scotia Bay, Station 325. 1903. A few specimens.

This species is widely distributed in Antarctic and sub-Antarctic seas. It very closely resembles *Djerboa furcipes*, except in the telson, which is undivided. Fuller details concerning it will be found under the last reference given above.

Genus HALIRAGOIDES O. Sars, 1893.

Haliragoides australis, sp. nov.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. May 1903. A few small specimens, about 3 mm. long; all very delicate and fragile.

The specimens are almost too delicate and fragile to allow of a full description, but there is no doubt that they belong to this genus, and that they come pretty close to *H. inermis* (O. Sars) from the northern seas. They appear to differ in having the first and second segments of the pleon slightly produced backwards into a small dorsal tooth; the postero-lateral angle of the third pleon segment is produced to a small acute tooth. The head has a more distinct rostrum curving considerably downwards; the eye is large, well-developed, oval, but colourless in spirit specimens. The first gnathopod differs in having the propod somewhat narrowed at the base and the palm slightly shorter than the hind margin. In all other points that can be observed the specimens seem to be very close to *H. inermis*.

The occurrence of this species at the South Orkneys adds another to the list of cases where a northern species of a genus is represented in the south by the same species or by one closely allied.

Genus EUSIRUS Kröyer, 1845.

In order to make clear what is now known about the species of *Eusirus* from sub-Antarctic seas it seems desirable to give the following historical account :—

In 1880 G. M. THOMSON identified specimens from New Zealand with the northern species *E. cuspidatus* Kröyer, but distinguished them as a new variety, *antarctica*.

In 1888 STEBBING examined two specimens collected by the *Challenger*, one from Kerguelen and the other from Heard Island, and referred them to *E. longipes* Boeck, another northern species, saying that they were distinguished from *E. cuspidatus* by the absence of the spine-teeth from the apex of the second joint of the maxilliped palp.

In 1893 SARS in identifying specimens from the Lofoten Isles with *E. longipes* gave the points which he considered distinguish it from the other species, and said that the form recorded under this name from the *Challenger* Expedition is scarcely identical with BOECK's species.

In the same year DELLA VALLE included all the forms mentioned above under *E. cuspidatus.*

In 1903 WALKER described a new species, *E. lævis*, from the *Southern Cross* Expedition, and said: "It may be easily distinguished from the other known species by the absence of dorsal teeth on the segments and by the entire margins of the third metasome segment and the first joints of the peræopoda. From *E. cuspidatus*, var. *antarctica*, Thomson, it is separated by the conspicuous dactylus of the maxillipeds."

In 1906 STEBBING combined the *Challenger* specimens with those described by THOMSON, and gave them under the name *E. antarctica*, thus raising THOMSON'S variety to the rank of a species. In describing it he says it is "exceedingly like *E. propinquus*" —another northern species.

In 1907, from the National Antarctic Expedition, WALKER examined many specimens of *Eusirus*, some of them of large size. These he referred to *E. propinquus* G. O. Sars, giving a few points in which they differ, but stating that these are due to age. At the same time he described another new species, *E. microps*, "recognisable by the relatively small eyes and slender hirsute legs. From its nearest ally, *E. holmi* H. J. Hansen, it differs in the structure of the gnathopoda." He makes no further comparison of these specimens with either *E. antarctica* or *E. lævis.*

In the same year CHEVREUX described two specimens obtained by the French Antarctic Expedition as the male and female of a new species, *E. laticarpus.*

It will thus be seen that the question is already pretty complicated, and that the path of anyone endeavouring to identify species of *Eusirus* from Antarctic seas is by no means free from difficulty.

Eusirus antarcticus G. M. Thomson.

Eusirus cuspidatus, var. *antarctica*, G. M. Thomson, 1880, p. 4, and 1881, p. 26.
„ *longipes* Stebbing, 1888, p. 965, pl. lxxxvii.
„ *antarcticus* Stebbing, 1906, p. 340.
„ *propinquus* Walker, 1907, p. 30.
„ *laticarpus* Chevreux, 1906B, p. 149, figs. 27–30.
(?) „ *lævis* Walker, 1903A, p. 55, pl. x. figs. 70–76.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. June 1903. One male, not well preserved.

Station 201, lat. 59° 43′ S., long. 30° 44′ W.; in clear water among floe, surface. 13th February 1903. Temperature 30°·1. One female.

Off Coats Land, lat. 72° 31′ S., long. 19° 00′ W.; vertical net, 1–1000 fathoms. 5th March 1904. Temperature 30°. One female.

Station 411, Coats Land, lat. 74° 1′ S., long. 22° W.; 161 fathoms. One specimen.

These specimens agree in nearly all respects with the description given by CHEVREUX of *E. laticarpus.* The females agree with his, and differ from the male in

the much longer and more slender antennæ and in the greater depth of the cleft in the telson; the eye is rather small, oval, or very slight reniform. These specimens are therefore somewhat different from the specimens from Kerguelen Island described by STEBBING in the *Challenger* Reports. I think, however, that CHEVREUX is right in considering the two specimens examined by him as male and female of the same species, for, in addition to the female specimens of which I have spoken above, I have one specimen from Station 325 which by the character of the antennæ is almost certainly a male, and it agrees very closely with the form described by CHEVREUX as the male. It has the teeth at the end of the antennal joints a little longer than is shown in his figures, but they are arranged in the same way, and the difference in degree is probably due to age. This specimen, like his, has the eyes large, oval, and, in the spirit specimen, of a reddish-brown colour. I have carefully compared it with the full description given by STEBBING of the *Challenger* specimens, and it agrees minutely in everything except that the telson is less deeply cut. My specimen is, however, about 12 mm. long, while his is only 7·5 and was probably immature. This seems to be confirmed by the fact that the antennæ in it are not modified in the special way described by CHEVREUX. In the young male we would naturally expect to find the telson more like that of the female. WALKER also has stated that the cleft in the telson becomes shallower in older forms.

From the resemblance of my specimens to those described by CHEVREUX, and of the male to STEBBING'S, I cannot help coming to the conclusion that *E. laticarpus* must be specifically identical with *E. antarcticus*.

To this species must, I think, be added the forms referred by WALKER to *E. propinquus*. I have been fortunately able to examine two specimens obtained by the *Nimrod* in the same locality as WALKER'S specimens, and I cannot find sufficient differences to separate them from the *Scotia* specimens. They are 7·5 mm. long, and appear to be males, having the antennæ short and provided with calceoli; the eyes are nearly round, of moderate size, and the telson has the cleft deeper—nearly as deep as in the form figured by CHEVREUX as the female. The other characters agree very closely, and the points of difference noted are probably due to age. The back of the pleon and of the posterior portion of the peræon is somewhat scabrous.

STEBBING has given the apparent absence of calceoli as one of the characters of *E. antarcticus*, but I expect they will, as in so many other species, be found to be normally present in fully mature males. They are certainly present in my *Nimrod* specimens, though, as stated above, these specimens may be more or less immature; the calceoli are, however, extremely delicate, and appear much more elongated than is usually the case, and a character that is much more easily observed is the downward projection of every second joint of the flagellum as described and figured by CHEVREUX. The male specimen from Station 325 is not in a sufficiently good state of preservation (having apparently been partially dried) to show the calceoli, but the antennæ show the other modifications of the male. WALKER makes no mention of calceoli in his speci-

mens, nor of the sexual differences, but states generally that the length of the flagellum of the antennæ and of the cleft in the telson varies with age.

It will be seen that, as STEBBING points out, this Antarctic species is very close to *E. propinquus* of northern seas, and probably WALKER is correct in definitely identifying it with that species; the resemblance, however, to other northern species, *e.g. E. longipes*, is also very close, and I think it will be better in the meantime to leave the southern form under a distinctive name. The differences between all the described species of the genus are very slight, and probably further research will lead to a reduction of the number.

E. lævis Walker was described from a single specimen, the size of which is not given; from the shortness of the flagella of the antennæ and of the projections of the carpus, and from the absence of dorsal teeth, it seems likely that it was an immature specimen, perhaps belonging to this species.

With regard to *E. microps* Walker I do not feel able to express any definite opinion; some of the specimens were of large size, and the long antennæ would indicate that they were females, but, on the other hand, the telson is only very slightly cleft.

M. CHEVREUX has recently (1911B, p. 405, fig. 3), described another species, *E. bouvieri*, from the South Sandwich Islands, but in view of the variations in this species described above, it seems doubtful if the differences noted in the dorsal margin of the first segment of the urus, and in the smaller depth of the cleft of the telson, are of very much importance. His single specimen was an ovigerous female, but has the short antennæ which appear to be the mark of the male as pointed out by CHEVREUX himself in *E. laticarpus*.

Eusirus splendidus, sp. nov. (Pl. II. fig. 20.) *

South Orkneys, Scotia Bay, Station 325. 15th August 1903. 54 fathoms. Two specimens, both males: No. 1, 30 mm., No. 2, 35 mm. in length of body.

First four segments of peræon slightly compressed; hinder portion of body much compressed, carinate, with pronounced dorsal teeth projecting backwards on the three last segments of peræon and on the three segments of pleon; first segment of urus with dorsal depression followed by slight carina on the posterior portion; second and third rounded. Side plates 1–4 slightly deeper than their respective segments; first produced anteriorly into a rounded lobe reaching nearly to anterior margin of head, its posterior angle with two or three teeth; second and third rounded below, with two or three small teeth at the posterior angle; fourth broader, its posterior margin produced into a subacute lobe below the fifth, lower margin rounded, posterior margin below production serrate; fifth with the posterior lobe deeper than the anterior; sixth with the posterior lobe produced downwards, much deeper and broader than the anterior; seventh, small, rounded below, not divided into lobes. Epimeral plate of the first pleon segment narrowly rounded below; second, much broader, rounded anteriorly, posterior

* Probably the same as *Eusirus perdentatus* Chevreux (*Bull. Muséum Hist. Nat.*, 1912, No. 4, p. 10).

angle quadrate and very slightly produced; third, rounded anteriorly, inferior margin slightly convex, posterior more strongly convex, posterior angle quadrate (fig. 20).

Eyes large, prominent, oval, less darkly pigmented in the larger specimen. Upper antennæ more than half the length of the body, first segment stout, with sharp tooth below and smaller lateral teeth at its extremity; second as long as the first, but much more slender, ending in numerous sharp teeth which are almost as long as the third joint; third joint very short, also ending in sharp teeth; flagellum much longer than the peduncle, many-jointed, each second joint produced below and bearing calceoli in addition to other setæ, proximal joints very short; accessory flagellum slender.

Gnathopoda similar to those of *E. antarcticus*, but with the propod broader; second gnathopod slightly larger than the first; first and second peræopoda very slender, longer than the gnathopoda; third, fourth, and fifth pairs increasing in length, the fifth being about as long as the peræon and pleon combined. First uropod with outer branch about two-thirds the length of the inner, which is as long as the peduncle; second with outer branch half the length of the inner and as long as the peduncle; third with peduncle short, branches subequal and slender; telson more than twice as long as the peduncle of third uropod, very narrow, with two slight lateral ridges on the upper surface and a shallow central groove between them; cleft not more than one-sixth the length, the two posterior lobes very acute and widely divergent.

Length of body: up to 35 mm.

It is only with great reluctance that I establish this new species, but the compression of the hinder part of the body and its production into carinal teeth is carried to a much greater degree than in any of the species of *Eusirus* known to me. In all the specimens of *E. antarcticus* only the pleon segments are produced into teeth, with occasionally a small tooth on the last segment of the peræon; and until transitional forms are known it will, I think, be safer to rank the present specimens as a separate species. There are also some differences in the uropoda, but whether these are merely associated with age or not I cannot say.

The general resemblance to *E. antarcticus* in the appendages is, however, so great that I should not be surprised if it proves ultimately to be a special form of that species. WALKER has, however, had larger specimens before him which apparently showed only the normal amount of carination.

Genus EURYMERA Pfeffer, 1888.

Eurymera monticulosa Pfeffer.

Eurymera monticulosa Pfeffer, 1888, p. 103, pl. i. fig. 3.
„ „ Stebbing, 1906, p. 357.
„ „ Chevreux, 1906B, p. 59, figs. 34–36.

South Orkneys, Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom, clumps of weed. 3rd December 1903. Temperature 29°·1. One specimen, imperfect, 15 mm.

This agrees well with the descriptions given by PFEFFER and CHEVREUX, except that the third uropod does not extend much beyond the others. In the upper antennæ every second joint of the flagellum is slightly expanded below and bears sensory setæ, thus having somewhat the appearance of the flagellum in *Paramæra austrina*; in this character the antennæ agree exactly with the original description given by PFEFFER.

I have been able to compare my specimen with those in the Hamburg Museum originally described from South Georgia by Dr PFEFFER, and thus to confirm the identification.

M. CHEVREUX records the species from Booth Wandel Island.

Genus BOVALLIA Pfeffer, 1888.

Bovallia monoculoides (Haswell).

Atylus monoculoides Haswell, 1880, p. 327, pl. xviii. fig. 4.
Bovallia gigantea Pfeffer, 1888, p. 96, pl. i. fig. 5.
„ „ Chevreux, 1906B, p. 54, figs. 31–33.
„ „ Stebbing, 1906, p. 357.
Eusiroides monoculoides Stebbing, 1906, p. 345, and 1910A, p. 595.
„ „ Chevreux, 1908, p. 475.
„ *crassi* Stebbing, 1906, p. 346, and 1910A, p. 594.
„ *cæsaris* Stebbing, var. Walker, 1904, p. 264, pl. iv. fig. 22.
Bovallia monoculoides Chilton, 1909A, p. 622.

Several specimens from shore pools and moderate depths at South Orkneys, Scotia Bay, Station 325. Largest specimen 37 mm. long.

These specimens agree well with the descriptions of *Bovallia gigantea* given by PFEFFER and CHEVREUX. They have the last segment of the peræon and the first two segments of the pleon carinate and produced into an acute dorsal tooth; the third segment of the pleon bearing a blunt tooth. In smaller specimens these teeth are less marked. They thus agree also with the description originally given by STEBBING for *Eusiroides cæsaris*, but they differ from it in having the posterior margin of the third segment of the pleon slightly convex and without serrations. The accessory flagellum of the first antenna is present, but is small, and appears to be united with the third joint of the peduncle much in the same way as I have described for the specimens of *Atylus megalophthalmus* Haswell, which are now considered to be a form of the widely spread *Paramæra austrina* (Bate).

Through the kindness of the authorities of the Hamburg Natural History Museum, I have been able to examine co-types of *Bovallia gigantea* Pfeffer from South Georgia. These are larger than the largest *Scotia* specimens, and the dorsal teeth are slightly less acute, but there is no difference of any importance. That the dorsal teeth are subject to considerable variation was already known from their varying development in the three species of *Eusiroides* originally described by STEBBING. Two of these, *E. cæsaris* and *E. pompeii*, were united by STEBBING in the *Das Tierreich Amphipoda*, and

identified with *Atylus monoculoides* Haswell. In 1909 I urged reasons for uniting with it the third species also, *i.e. E. crassi*, and pointed out the identity of the whole with *Bovallia gigantea*.

About the same time STEBBING independently examined additional specimens from Australia, and, speaking of *E. crassi*, said: "Whether this can be retained as a species distinct from *E. monoculoides* seems doubtful."

The amount of serration on the posterior margin of the third pleon segment may be considerable, as in the form described under the name *E. cæsaris*, or may be altogether absent, as in the specimens now before me. This variation has already been referred to by STEBBING, WALKER, CHEVREUX, and myself, and need not be further discussed.

Along with some of the specimens which he described under the name "*E. cæsaris* Stebbing, *var.*" WALKER found an ovigerous female, 5 mm. long, which with some hesitation he described as a new species, *E. orchomenopsis*, the main difference being that in the third uropoda the outer branch is much the longer and has a terminal joint. Mr WALKER is disposed to think that, though sexually mature, this specimen has not attained the full mature characters.

Genus PONTOGENEIA Boeck, 1871.

Pontogeneia danai (G. M. Thomson).

Atylus danai G. M. Thomson, 1879, p. 238, pl. x.c, fig. 1.
„ *lippus* Haswell, 1880, p. 328, pl. xx. fig. 1.
Eusiroides lippus Stebbing, 1906, p. 346.
Pontogeneia danai Stebbing, 1906, p. 360.
„ „ Chilton, 1912, p. 130.

Falkland Islands, Cape Pembroke, Station 118; among calcareous algæ. January 1903. Several specimens, some poorly preserved, the largest 6 mm. long.

Some specimens appear to have been partially dried, and it is not easy to make out the necessary points in the antennæ with certainty, but others better preserved show that they differ from the next species in having every fourth or fifth joint of the flagellum of the upper antennæ produced below and crowned with a tuft of sensory setæ; in *P. antarctica* every *third* joint is dilated to a less extent. In both species the dilatations are closer together on the six or seven basal joints of the flagellum. In the present species, too, the antennæ are more nearly equal in length, the gnathopoda are more slender, and the telson is perhaps rather more deeply cleft. The differences—particularly the one last mentioned—are all rather slight.

I have been able, since the above paragraph was written, to compare the Falkland Island specimens with specimens of *P. danai* G. M. Thomson from New Zealand, and think they must be considered the same. In the Falkland Island specimens the peduncle of the upper antenna bears rather longer setæ on the under surface, but it also bears on that surface a number of calceoli on slight projections, giving a scabrous appearance which is well marked in the New Zealand specimens.

Mr STEBBING has put *Atylus lippus* Haswell down as a doubtful species of *Eusiroides*, but I have specimens from Sydney Harbour that I think certainly belong to HASWELL'S species, and these I cannot distinguish from the species common on New Zealand coasts which was described as *Atylus danai* by Mr THOMSON. The species is therefore now known from Australia, New Zealand, and the Falkland Islands, and probably extends round the globe in sub-Antarctic seas.

Pontogeneia antarctica Chevreux.

Pontogeneia antarctica Chevreux, 1906A, p. 72, fig. 2, and 1906B, p. 69, figs. 40 and 41.
„ „ Chilton, 1909A, p. 624.

South Orkneys, Scotia Bay, Station 325 ; in shore pools and at moderate depths. Several specimens, the largest 6 mm. long.

These specimens agree well with CHEVREUX'S description, and can be distinguished from the preceding most easily by the character of the upper antennæ, as described above.

Though this species seems to be a true *Pontogeneia*, yet in the somewhat slender antennæ it makes some approach towards the genus *Paramœra*, and at the end of the third joint of the upper antenna there is a short process tipped with one or two long hairs that appears to represent a vestigial accessory flagellum, but it is fused with the third joint of the peduncle somewhat as appears to be the case in *Atylus megalophthalmus* Haswell, which is looked upon as a variety of *Paramœra australina* (Bate). *Pontogeneia antarctica* is, however, clearly distinguished from *Paramœra* by having every *third* joint of the primary flagellum expanded below, instead of every second, and also by the lobes of the telson being rounded posteriorly.

The species is known from Auckland and Campbell Islands, from Flanders Bay and Booth Wandel Islands, as well as from the South Orkneys, and thus appears to represent *P. danai* in colder and more southerly seas.

Genus ATYLOIDES Stebbing, 1888.

Atyloides magellanica (Stebbing). (Plate I. fig. 18.)

Atylopsis magellanica Stebbing, 1888, p. 925, pl. lxxix.
Pontogeneia magellanica Stebbing, 1906, p. 360.
„ „ Walker, 1907, p. 33, pl. xii. fig. 20.
„ „ Chevreux, 1906B, p. 64, figs. 37–39.
Atyloides magellanica Chilton, 1909A, p. 627.

South Orkneys, Scotia Bay, Station 325 ; shore pools. 2nd February 1904. Temperature 32°–35°. Numerous specimens, the largest about 10 mm. long.

These agree well with the description of this species given by CHEVREUX. It is evident that the telson varies to some extent. CHEVREUX figures it with a seta arising from a slight notch on each half. WALKER says "the divisions of the telson are smooth and rounded at the tips," and shows it with the sides converging and convex, without

terminal setæ or notch. In one specimen I find one half with a notch and the other without (Plate I. fig. 18); in others it closely resembles the figure given by CHEVREUX.

The species is found in all sub-Antarctic seas.

Atyloides serraticauda Stebbing.

Atyloides serraticauda Stebbing, 1888, p. 920, pl. lxxviii., and 1906, p. 36.
" " Walker, 1907, p. 33.
" " Chevreux, 1906B, p. 87.
" " Chilton, 1909A, p. 627.
(?) *Schraderia gracilis* Pfeffer, 1888, p. 141, pl. ii. fig. 5 (no description, only one figure).

South Orkneys, Scotia Bay, Station 325; shore pools. 2nd February 1904. A few specimens, the largest 12 mm. long.

In fully grown specimens this species may be recognised by the long antennæ, gnathopoda, and peræopoda, and particularly by the serrations on the side plates and on the hinder margin of the third pleon segment. These serrations may, however, be almost completely absent in smaller specimens, and the species is by no means so easy to recognise, and the identification then depends mainly on the telson.

Schraderia gracilis was named in 1888 by PFEFFER, but not described, only a general figure of the whole animal being given. This figure without drawings of the separate appendages is quite insufficient for identification in this group, which contains so many species very nearly alike in general appearance; and as it is not now possible to ascertain from which individual specimen the drawing was made, PFEFFER'S species must remain doubtful. There are several specimens in the collection of the Hamburg Museum labelled "*Schraderia gracilis*," and these prove to belong to the species now under consideration, *Atyloides serraticauda* Stebbing.

The species is widely distributed in Antarctic and sub-Antarctic seas.

Atyloides calceolata, sp. nov. (Plate II. figs. 21–23.)

South Orkneys, Scotia Bay, Station 325; 10 fathoms. A few specimens, mostly imperfect, about 5 mm. long.

Specific Description.—Similar to *Atyloides serraticauda* in general shape of body, in the serrations on the anterior side plates, the posterior margins of the basal joints of the peræopoda, the posterior margin of the third segment of the pleon, and in the telson; differing mainly in the antennæ. The first antenna (fig. 21) with the first joint longer and considerably stouter than the second, its lower margin bearing distally an acute spine with another shorter spine placed laterally, a few long setæ near the end joint; second joint bearing on its under surface two well-marked calceoli of characteristic shape, one on a little prominence at a short distance from the proximal end and the other near the distal end, some fine setæ at the end of the joint; third joint short; the whole antenna about as long as the body.

Second antenna (fig. 21) with the gland cone very acute; the third joint short, pro-

duced inferiorly into one or two distal teeth, and with a spinule on the upper side; fourth joint twice as long as the third, bearing on its upper surface two calceoli, each on a slight projection similar to those on the second joint of the upper antenna, a few fine setæ scattered on both margins of the joint and at the distal end (rest of antenna missing).

Gnathopods (figs. 22 and 23) similar in general shape to those of *A. serraticauda*, but not quite so slender, the second gnathopod having the propod much longer than the carpus, sub-oblong, but expanding somewhat towards the palm, which is slightly oblique and defined by one or two small spinules, the whole of the long hind margin bearing short tufts or transverse rows of spinules.

The peræopoda similar to those of *A. serraticauda*; the third uropod rather short, branches not very much longer than the base, lanceolate, and bearing spinules and fine serrations on the margin; telson cleft for about two-thirds its length, each half oblong, posterior margin of each truncate and divided into about eight or nine fine teeth.

I have only a few specimens of this species, and in most of them portions of the antennæ and some of the other appendages are broken off; but the arrangement of the calceoli on the peduncles of the antennæ seems characteristic, and differs from that in any of the allied species known to me.

Genus Paramœra Miers, 1875.

Paramœra austrina (Bate).

Atylus austrinus Spence Bate, 1862, p. 137, pl. xxvi. fig. 4.
Paramœra australis Miers, 1875, p. 75.
Atyloides australis and *A. assimilis* Stebbing, 1888, p. 914, pl. lxxv., and p. 918, pl. lxxvii.
Megamœra fasciculata G. M. Thomson, 1880, p. 5, pl. i. fig. 5.
Stebbingia gregaria Pfeffer, 1888, p. 110, pl. ii. fig. 7.
" " Stebbing, 1906, p. 358.
Paramœra austrina Stebbing, 1906, p. 363, 1910A, p. 640, and 1910B, p. 450.
" " Chilton, 1909A, p. 625.

Specimens of this species were obtained from the following stations:—

South Orkneys, Scotia Bay, Station 325; 10 fathoms.
" " Scotia Bay, Station 325A; dredge, 2–8 fathoms, gravel and clumps of weed; temperature 29°–30°. 6th December 1903.
" " Scotia Bay, Station 325; dredge, 9–10 fathoms. April 1903.
" " Scotia Bay, Station 325; dredge, 4 fathoms, gravel bottom and clumps of weed; temperature 29°·1′. 3rd December 1903.
" " Scotia Bay, Station 325; 5–10 fathoms; temperature 31°·5′. 2nd January 1904.
Falkland Islands, Station 118; shore. 7th January 1903.
" " Cape Pembroke, Station 118; shore pools. January 1903.
Gough Island, Station 461; trap, 75 fathoms. 21st April 1904.
" " Station 461; off floating kelp. 21st April 1904.

A special variety of the species was obtained as follows:—

South Africa, entrance to Saldanha Bay; 25 fathoms. 21st March 1904.

This species is one that is very widely distributed in sub-Antarctic seas, and is usually found in shore pools or in shallow waters around the coast. It has been pointed out by several authors that specimens of it vary considerably; probably when the different forms are carefully compared it may be possible to distinguish several local varieties, but I think, in the present state of our knowledge, that Mr STEBBING is right in uniting the various forms under this one name.

Through the kindness of the authorities of the Hamburg Museum I have been able to examine the type and other specimens of *Stebbingia gregaria* Pfeffer, and I find that they undoubtedly belong to this species. Several of them are of comparatively large size, but they show no distinction of importance from the ordinary form, and the small accessory flagellum of the upper antenna is present. Various authors have described this accessory flagellum as being absent in the specimens examined by them, and, though I have usually been able to find it, there are a few specimens that I have seen in which I have been unable to do so, although in all other points they seem to belong to the species; and there seems little doubt, as pointed out by WALKER and others, that in this as in some other species the small accessory flagellum may sometimes be actually absent; probably this is more commonly the case in older forms.

Of the local varieties I can at present indicate two:—

(1) The form described under the name *Atylus megalophthalmus* Haswell. In this form the head has a rostrum nearly half as long as the first joint of the upper antenna; the accessory flagellum, though apparently present, is small, short, and fused to the third joint of the peduncle; and the telson has the posterior portion of each lobe somewhat rounded and without setæ.

(2) The forms mentioned above from South Africa, Saldanha Bay. In general appearance, and in the antennæ and gnathopods, etc., these agree closely with forms from other localities, but they differ somewhat markedly in the telson, the posterior portion of each lobe of which is cut into three or four acute teeth and is without setæ. In some forms from other localities there may be two such teeth, but, so far as I know, not more, and the telson usually bears two or more long setæ on each lobe. The telson in the Saldanha Bay variety closely resembles that described by CHEVREUX for *Atyloides longicornis* from Port Charcot, etc., a species which appears to me to be little more than a variety of *Paramœra austrina* in which the accessory flagellum is absent and the gnathopods are rather small.

Even in the more typical forms there seems to be considerable variation in the size and shape of the gnathopods. In some the propod is oblong, with the palm almost transverse, as shown by Mr STEBBING in his drawings of *Atyloides australis* Miers; in others the propod is more oval, with the palm somewhat oblique; the length of the carpus is also subject to variation, and the setæ seem to be more abundant on the antennæ and gnathopods in some specimens than in others.

This species had been recorded from South Africa by Mr STEBBING under the name of *Atyloides assimilis*, from a specimen found on the screw of the *Challenger* off Cape Agulhas. Mr STEBBING's figure of the telson shows some approach to that of the Saldanha Bay specimens, but each lobe bears only two acute teeth.

Genus DJERBOA Chevreux, 1906.

Djerboa furcipes Chevreux.

Djerboa furcipes Chevreux, 1906B, p. 74, figs. 42–44.

South Orkneys, Scotia Bay, Station 325; 10 fathoms. (No date.) A few specimens, the largest 15 mm.

South Orkneys, Scotia Bay, Station 325; 15 fathoms. April 1903. Six specimens, the largest 18 mm. long.

These specimens agree well with the description and figures given by CHEVREUX. They bear a very close and striking resemblance to *Leptamphopus novæ-zealandiæ*, and it is very difficult to distinguish the two species without dissecting off the telson, which is deeply cleft in *Djerboa furcipes* but undivided in *Leptamphopus novæ-zealandiæ*; in the first species, however, the integument is marked by a number of short marks arranged more or less in parallel lines, and in doubtful cases this helps as a guide to their identification.

Genus PARACERADOCUS Stebbing, 1899.

Paraceradocus miersii (Pfeffer).

Megamœra miersii Pfeffer, 1888, p. 121, pl., fig. 3.
Paraceradocus miersii Stebbing, 1906, p. 429.
„ „ Chevreux, 1906B, p. 93.

South Orkneys, Station 325; from stomach of Weddell seal. 4th January 1904. One male, 45 mm. long.

South Orkneys, Station 325; dredge, 9–10 fathoms. 17th August 1903. One female, 22 mm. long; June 1903, one female, 20 mm.

In the large specimen all the segments of the peræon and pleon are rounded dorsally; the pleon is slightly compressed but not carinate; teeth are present on the first and second segments of the urus as described; the third uropods are missing. The female specimens also show no carination on the peræon or pleon, and have the third uropods of moderate size only. The upper antennæ are considerably longer than half the body; the second joint of peduncle is as long as the first, and the flagellum is considerably longer than the peduncle. In the lower antennæ the flagellum is longer than the last joint of the peduncle. Except for the absence of carination, the specimens agree closely with PFEFFER's description.

This fine species is now known from South Georgia, South Orkneys, Port Charcot, Booth Wandel and Hovgaard Islands.

Genus Mæra Leach, 1813.

Mæra mastersii (Haswell).

Megamœra mastersii Haswell, 1880A, p. 265, pl. xi. fig. 1.
„ *thomsoni* Miers, 1884, p. 318, pl. xxxiv. fig. B.
Mæra mastersii Stebbing, 1906, p. 439.
„ „ Chilton, 1911, p. 594.

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. Five specimens, the largest 10 mm. long.

Although they show some differences, I think these specimens may be referred to this species. On the whole they agree fairly well with Haswell's description; and if the form described as *Megamœra thomsoni* by Miers really belongs here, the species is evidently a variable one. My specimens differ from the description given by Stebbing in *Das Tierreich* in the following points:—The third segment of the pleon has the posterior angle produced so as to be acute, but the hind margin is hardly denticulate; the eyes are small, almost round; in the upper antenna the first joint has a stout spinule at its lower distal margin, the accessory flagellum contains seven joints; the flagellum of the second antenna is considerably longer than the last joint of the peduncle. In the first gnathopod the carpus and propod are hardly slender, each having the posterior margin convex and agreeing fairly well with Haswell's description; this appendage shows considerable resemblance to that of *Elasmopoides chevreuxi* Stebbing, but the carpus and propod have the hind margins less strongly convex than in that species. The second gnathopod agrees well with the description. The third, fourth, and fifth peræopoda are fairly stout, the basal joint has the hind margin only finely serrated. The uropoda and the telson agree well with Haswell's description. The specimens are colourless (in spirit) and do not show the light yellowish-brown colour mentioned by Stebbing, which was present in the Kermadec Island specimens I examined in 1911. In the rather stout peræopoda and in some other points they have rather the appearance of an *Elasmopus*.

This species is widely distributed in the warmer southern seas.

Genus Paradexamine Stebbing, 1899.

Paradexamine pacifica (G. M. Thomson).

Dexamine pacifica G. M. Thomson, 1879, p. 238, pl. x.B, fig. 4.
Paradexamina pacifica Stebbing, 1906, p. 518.
„ „ Chilton, 1909A, p. 632.
Paradexamina fissicauda Chevreux, 1906B, p. 88, figs. 51–53.

South Orkneys, Station 325; 9–10 fathoms. April and May 1903. Four specimens, the largest 17 mm. long.

South Orkneys, Scotia Bay, Station 325; 2–8 fathoms, gravel and clumps of weed. Temperature 29°–30°. 6th December 1903. Several specimens, the largest 14 mm. in length.

These specimens are in most respects intermediate between *P. pacifica* and *P. fissicauda*. They agree with the latter species, except that the last segments of the peræon are without dorsal teeth, or, in the largest, with a small tooth on the last segment only. In this species, as in so many others, the dorsal teeth evidently vary, for STEBBING notes the same thing in his description of *P. pacifica*. The *Scotia* specimens have the lateral angle of the head rounded, as in *P. fissicauda*, and they resemble that species also in the greater stoutness and the proportions of the joints of the antennæ and peræopoda; the telson, however, is not split right to the base, but only very deeply, as in *P. pacifica*.

Through the kindness of Mr STEBBING I have been able to examine specimens of *P. pacifica* from New Zealand sent to him years ago by Mr THOMSON. The comparison of these with the *Scotia* specimens shows that it is not possible to maintain the two as separate species. In the carination of the body, in the uropoda and telson, the New Zealand specimens resemble those from the South Orkneys. They differ, however, in having the appendages slightly more slender; thus the upper antennæ may have the second joint of the peduncle considerably longer than the first, and in the peræopoda the propod may be nearly as long as the carpus, instead of being shorter, as described by CHEVREUX. In them, too, the lateral angle of the head is produced into a small, sharp, acute point.

If we had to deal only with the New Zealand specimens and those from Wandel Island, it might be possible to look upon the latter as a separate but closely allied species; but, if that were done, a new species would have to be made for the South Orkneys specimens, with characters almost precisely intermediate between those of the other two, while future examination of specimens from some fresh locality would probably necessitate the establishment of another intermediate species on very trivial points of difference. I therefore think it much the best course to consider all the specimens as belonging to one widely spread sub-Antarctic and Antarctic species which, through isolation, has become slightly modified into two or three local varieties.

Genus POLYCHERIA Haswell, 1879.

Polycheria antarctica (Stebbing).

Dexamine antarctica Stebbing, 1875, p. 184, pl. xv.A, fig. 1.
Polycheria tenuipes Haswell, 1880B, p. 345, pl. xxii. fig. 8.
„ „ Stebbing, 1906, p. 520.
„ *brevicornis* Haswell, 1880B, p. 346.
„ *obtusa* G. M. Thomson, 1882, p. 233, pl. xvii. fig. 3.
Tritæta kergueleni Stebbing, 1888, p. 941, pl. lxxxiii.
„ *antarctica* Walker, 1904, p. 266, pl. iv. fig. 25.

Polycheria antarctica Stebbing, 1906, p. 520.
,, ,, Walker, 1907, p. 34.
Tritæta osborni Calman, 1898, p. 268, pl. xxxii. fig. 2, and p. 288.
Polycheria atolli Walker, 1905, p. 926, pl. lxxxviii. figs. 1–5.

Entrance to Saldanha Bay, Station 483. One specimen, 6 mm. long.
South Orkneys, Scotia Bay, Station 325. Many specimens, all of small size, averaging 2 mm. in length.

The specimen from Saldanha Bay is, I think, specifically identical with the *Challenger* form described under the name *Tritæta kergueleni*. The eye is very large, occupying the greater part of the side of the head; the posterior angle of the third pleon segment is quadrate, with a very short tooth, and the pleon and urus have the carination described, though to a less degree; the antennæ agree with the description as regards the proportions of the joints, the lower being a little longer than the upper; the branches of the third uropods are slightly unequal.

In the large eye and in other essential points it also agrees with *P. tenuipes* Haswell, and with *P. obtusa* G. M. Thomson, whose description of the terminal joints of the peræopoda applies exactly to the specimen under consideration. In describing his specimen Mr Thomson pointed out that it was probably the same as *P. tenuipes* Haswell. On the other hand, the Saldanha Bay specimen differs from the Kerguelen Island one in the side plates, which are not so acutely produced anteriorly.

The specimens from South Orkneys are all small. The eye is of much smaller size, and the carination of the pleon is absent altogether or only slightly marked; the joints in the flagella of the antennæ are fewer in number, and the two antennæ are about equal in length; the outer branch of the third uropod is only about half the length of the inner; both the third and the fourth side plates are produced anteriorly into an acute lobe exactly like that figured by Stebbing for *P. antarctica* (1906, p. 520, fig. 91). In this respect, therefore, they differ from his description of *P. tenuipes*, with which they agree in some of the other points mentioned, for that species is described in *Das Tierreich Amphipoda* as having the fourth side plate reduced to a short, blunt lobe, this character being apparently taken from Calman's description of *P. osborni*, which Stebbing gives as a synonym of *P. tenuipes*.

These South Orkneys specimens are apparently immature, although the characteristic form of the terminal joints of the peræopoda and of the third and fourth side plates is already present, and I think there can be no doubt they belong to the same species as the Saldanha Bay specimen. In the smaller eye they resemble *P. brevicornis* Haswell, which does not seem to be separated from *P. tenuipes* by any other character of importance. Mr Walker (1907, p. 34) has pointed out that Haswell's description of the second gnathopod of *P. tenuipes* and of *P. brevicornis*, and his figure of that of the first species, are quite unlike those of *P. antarctica*. The figure is undoubtedly very rough and insufficient, but the descriptions, so far as they go, are not inconsistent with

either the Saldanha Bay or the South Orkneys specimens before me, and these, as I have said, must, I think, be referred to *P. antarctica*.

STEBBING, in 1906, made *P. osborni* Calman a synonym of *P. tenuipes* Haswell, to which he also assigned *P. obtusa* G. M. Thomson and, with a "?", *P. brevicornis* Haswell.

In describing *P. osborni*, CALMAN referred to the southern species described, and said they "are probably all referable to one." If this is done, however, it will then certainly be impossible to retain his species as distinct. This will be seen if we take the points of difference in order :—

1. Dorsal processes of urus much less prominent. This applies also to the South Orkneys specimens, and, to a less degree, to the Saldanha Bay specimen.

2. Maxillipeds with outer plates nearly equalling the palp in length and bearing only about eleven spines. In the South Orkneys specimens the plates bear only eleven spines, though they are rather shorter than the palp. In *P. atolli*, too, WALKER describes the spines on the outer plate as few in number and present on the distal portion of the margin only.

3. Propod of first gnathopod with palmar edge short and not more than one-third the length of the dactyl. In the Saldanha Bay specimen the gnathopod agrees well with CALMAN'S description, except that the palm is perhaps a little longer. From the appearance of this specimen, however, I think the palm is really longer than is shown in CALMAN'S figure, and that the lobe against which the dactyl is represented as impinging is overlapped by the dactyl folding in on one side of it. If this is so, there is no essential difference between the palm of *P. osborni* and that of *P. antarctica* as figured by STEBBING under the name *P. kergueleni*.

CALMAN'S description of the second gnathopod agrees quite well with that of the Saldanha Bay specimen.

4. Fourth side plate having the anterior process reduced to a short, blunt lobe. This applies also to the Saldanha Bay specimen and to *P. atolli* Walker.

5. Propod of third peræopod not widening distally. Both the Saldanha Bay and the South Orkneys specimens agree in this point with CALMAN'S figure rather than with STEBBING'S; the difference is one of degree only, and the widening is probably more marked in older specimens.

In view of all the considerations mentioned above, I feel compelled to unite also *P. atolli* Walker, from the Male Atoll, Maldive Archipelago, with *P. antarctica*. His description of the gnathopoda and of the first and second peræopoda, and of the side plates corresponding to these appendages, applies very well indeed to the Saldanha Bay specimen and also fairly well to *P. osborni*; but in the fewer spines and teeth on the outer plate of the maxillipeds and on the uropoda, *P. atolli* agrees rather with the South Orkneys specimens. Its chief peculiarity seems to be the fact that the palp of the first maxilla has "the top squarely truncate and crowned with short teeth," but in view of the other characters this is hardly sufficient to maintain it as a separate species.

The very large eye (red in colour, at least sometimes) found in some of the forms is certainly a very striking characteristic, and if it were constantly associated with other characters or with certain localities it would be entitled to great weight; but some specimens have the large eye associated with side plates which are not acutely produced anteriorly, while in the Kerguelen specimen the eye is large (black in this case) and the side plates are acutely produced; again, both the large-eyed and the small-eyed forms are found together in Port Jackson. It is just possible that the large eye is a sexual character, or it may be developed in older specimens which live at moderate depths, as appears to be the case in *Eusirus antarcticus*.

I have thus failed to find the characters relied upon for specific distinction in this genus constantly associated in any definite way, and am forced to conclude that all the forms belong to one species widely spread in southern seas and found also in the North Atlantic and in the Indian Ocean.

In addition to the localities mentioned above, the species *P. antarctica* has more recently been recorded from Ceylon by Mr WALKER, so that the conclusion that we are dealing with one species only, first arrived at on morphological grounds, is now confirmed by the geographical distribution of the species.

After the discussion as given above had been written, I was able to visit the British Museum and examine there the types of the different species; Mr WALKER also kindly sent me a specimen of *P. atolli*, and in doing so said that he now considered it probably not distinct from *P. antarctica*. I was able at the Museum to examine the type slides of *Tritæta kergueleni* Stebbing and of *P. atolli* Walker, and also to examine named specimens of *P. osborni* Calman, *P. antarctica* from the *Discovery* Expedition, and of *P. antarctica* recorded from Ceylon by Mr WALKER. The slide of the dissected parts of the *Challenger* specimen of *Tritæta kergueleni* is not in very good condition, but it is evidently the one from which Mr STEBBING's excellent figures were made, and these are sufficient for our present purpose.

The type specimen of *P. atolli* has the first maxilla with short spinules on the palp as described, and the maxillipeds also correspond closely to the figure given, but in all other essentials it agrees with my Saldanha Bay specimen, both gnathopods closely agreeing, except that in the first the flange on the propod has the margin minutely serrate; the first and second peræopoda, again, have side plates similar to those in the Saldanha Bay specimen. An examination of *P. osborni* showed that this species also was the same as the Saldanha Bay specimen, and therefore the same as *P. atolli*. The side plate of the first gnathopod is produced in front a little more acutely than in the type of *P. atolli*, and is tipped with two small setæ; the side plate of the second gnathopod is also produced in front, but not so acutely as the first, and might be described as being narrowly rounded anteriorly; that of the first peræopod is acutely produced, while the second is rounded as described by CALMAN. The eye is large.

The *Discovery* specimens labelled *P. antarctica* undoubtedly agree specifically with STEBBING's type of *Tritæta kergueleni* in having the side plates all more or less

acute, those of both the first and second peræopoda being acutely produced in front; the eye is large, showing a little colour in the spirit specimens and probably having been red in the living animal, but it is not so large as in the Saldanha Bay specimen. The terminal joints of the peræopoda are rather wide distally, as shown in STEBBING'S figure.

It seemed possible, therefore, that after all we might perhaps be dealing with two species: one *P. antarctica*, with side plates more or less acutely produced in front, the other *P. tenuipes* (including *P. osborni* and *P. atolli*), in which some of the side plates were rounded in front, although, as already shown, the differences did not appear to be constant. Considerable interest was therefore attached to the examination of the specimens from Ceylon referred by WALKER to *Tritæta antarctica*, to see if they were really distinct from *P. atolli*. It was found that in some points they are a little nearer to *P. antarctica* than the type specimen of *P. atolli* is; thus, for example, the side plates of the first gnathopod are acutely produced in front as in *P. antarctica*; the side plates of the second gnathopod, however, are rounded below. The side plates of the first and second peræopoda cannot be very clearly made out, but they appear to be fairly acute in front, though projecting rather more posteriorly than shown in STEBBING'S figure. In other points, however, these Ceylon specimens were clearly the same as *P. atolli*, and the eye is large and shows little colour in the spirit specimens. Consequently, after considerable hesitation, I was forced to remain at the conclusion at which I had previously arrived, that it is impossible to separate the various forms into two species. The species has more recently been recorded from the east coast of Africa by Mr WALKER under the name of *P. atolli*, and it was some confirmation of the conclusion I arrived at to find that specimens in the Museum from this locality, though recorded under the name *P. atolli*, were in the separate tube labelled by him *P. antarctica*.

It seems clear that here, as in other cases, we have one widely distributed species, most abundant in Antarctic and sub-Antarctic seas, but extending far to the north both in the Indian seas and in the Pacific, and that, although it is impossible to find constant characters for the separation of it into two distinct species, there are slight local differences, some showing one combination of characters, others another combination.

A small specimen of this species was among some undetermined Amphipoda, collected at South Georgia in 1882–83, that were submitted to me by the authorities of the Hamburg Museum.

[After the whole discussion of this species as given above had been written, I found further specimens from South Orkneys in a bottle of "residues" received in May 1912 from various collections made at Scotia Bay in 1903. Some of these specimens were larger than those from the South Orkneys mentioned above, the largest being about 5 mm. long. In the largest specimens the eye was very large, and red in colour, as in the Saldanha Bay and other specimens already referred to; in smaller specimens the

eye showed intermediate sizes, though in none of those examined was it quite so small as in the small South Orkneys specimens first examined. The side plates seem to be acutely produced as described for *Tritæta kergueleni*; but in at least one specimen the anterior lobe of the second peræopod was only subacute, and was shorter than that in the first peræopod. In the third uropods the outer branch is about half as long as the inner; in both branches the extremity is narrowed, almost free from setæ, and curves upwards.

In these respects, therefore, these additional specimens tend to confirm the conclusion arrived at that all the forms of *Polycheria* are referable to one species. They present a peculiarity, however, in having the telson particularly long, reaching to the end of the third uropod; in side view it appears thick, scarcely narrowing distally, and the margin is fringed with stout spinules. In the smaller South Orkneys specimens it is much shorter, reaching hardly half way along the branches of the uropod, and the spinules on it are few and much less prominent. In the specimen figured in the *Challenger* Report the telson is intermediate, reaching more than half way to the end of the third uropod, and bearing numerous spinules. In the smallest of the additional specimens now being described it is hardly so long as in the largest, but still longer than in some *Discovery* specimens from M'Murdo Sound that are themselves larger in size. It seems probable that the especially long and strong telson is a character developed beyond the average, like the large eye, and that it attains its full size only in specimens of a definite age—possibly it lengthens rapidly at a particular moult.]

Genus Nototropis A. Costa, 1853.

Nototropis homochir (Haswell).

Atylus homochir Haswell, 1885, p. 101, pl. xiii. figs. 5–7.
Nototropis homochir Stebbing, 1906, p. 333, figs. 77 and 78.
" " " 1910A, p. 639.
" " " 1910B, p. 455.

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. 21st May 1904. Several specimens, largest 10 mm. long.

These agree with Stebbing's description, except in a few small points: *e.g.* the third joint of the palp of the mandible is not longer than the second, but barely equal to it in length; the lower hind corner of the basal joint of the third peræopod (in the female) is slightly produced into a small subacute lobe; that of the fourth is not produced, but in the fifth peræopod it is produced as a subacute lobe reaching about to the end of the ischium.

The points which distinguish this species from some of those found in northern seas, *e.g.* from *N. vedlomensis* (Bate and Westwood), do not seem to be very great; it appears to differ from that species, however, in the amount of production of the basal joints of the peræopoda three to five, and in the size and arrangement of the

carinate teeth on the pleon and urus. DELLA VALLE in 1893 united both these two species and several others under the name *Atylus swammerdamii* (Milne Edwards).

The southern species is known from Australia and South Africa.

Another species which appears to belong to this genus was described in 1862 by SPENCE BATE under the name *Atylus villosus*, from specimens obtained at Hermit Island in the South Atlantic by the Antarctic Expedition under Sir JAMES CLARKE ROSS.

Genus TALORCHESTIA.

Talorchestia scutigerula (Dana).

Orchestia scutigerula Dana, 1853 and 1855, p. 863, pl. lviii. fig. 2.
,, ,, Spence Bate, 1862, p. 26, pl. iv. fig. 7.
Talorchestia scutigerula Stebbing, 1906, p. 545.

Falkland Islands, near Port Stanley, Station 118; from banks of a fresh-water, peaty stream. 7th January 1903. Two males and three females, the largest male 15 mm. in length.

These specimens agree very well with the description as given in *Das Tierreich Amphipoda*. The large expansion on the second joint of the fifth peræopod is very striking, and is very similar to the expansion on the fifth joint in *Talorchestia telluris* (Bate).

The species is known from Tierra del Fuego as well as from the Falkland Islands, and it was taken at Hermit Island in the South Atlantic, during the Antarctic Expedition under Sir J. C. Ross in 1840.

Genus HYALE.

Hyale grandicornis (Kröyer).

Orchestia grandicornis Kröyer, 1845, p. 292, pl. i. fig. 2 *a–n*.
Allorchestes verticillata and *A. peruviana* Dana, 1855, p. 886, pl. lx. figs. 2 and 3.
Hyale grandicornis Stebbing, 1906, p. 566.

Gough Island, Station 461; shore. One male, 12 mm. long.

I refer this specimen to KRÖYER's species without much doubt. It agrees minutely with the description of all its characters given by STEBBING in *Das Tierreich*, particularly in the pectination of the finger of the peræopoda; the setule on the finger is rather long and fairly distinct, but not strong. The hind margin of the basal joint of the fourth peræopod is furnished with small spinules as described, but they are very small, and they are also present, though not in quite such numbers, in the third and fifth peræopoda. Both the first and the second gnathopoda agree very closely with the description.

This species was described originally from Valparaiso, and *H. novæ-zealandiæ* (G. M. Thomson), which is found in New Zealand itself and in the sub-Antarctic islands lying to the south of it, appears to be almost the same.

Hyale saldanha, sp. nov. (Pl. II. figs. 24–29.)

South Africa, entrance to Saldanha Bay, Station 483; 25 fathoms. 21st May 1905. Several specimens, males and females, the largest about 9 mm. long.

Specific Description.—Male.—Back rounded, not carinate, and without dorsal teeth. Pleon segment three, with postero-lateral corner quadrate with slightly produced point. Eyes of moderate size, round. The first antenna (fig. 24) reaches to the middle of the flagellum of the second; peduncle with first joint much longer and broader than the second, and produced below at its distal end into a rather broad expansion, which appears to have a vertical flange, and at the lower part of this a thicker conical portion tipped with two setæ; second joint with a smaller similar expansion; flagellum of sixteen joints all bearing a fairly distinct tuft of long setæ at the lower distal angle. Second antenna (fig. 24) about one-third the length of the body; last two joints of the peduncle subequal; flagellum of about thirty-five joints. First gnathopod (fig. 27) with the basos rather broad except at the base; the carpus short, triangular, its posterior margin produced into a rounded fringed lobe; propod oblong, widening slightly distally, front margin convex and smooth, hind margin straight or very slightly concave, with a group of spinules at the centre; palm oblique, slightly convex, shorter than hind margin, defined by two stout spinules, the finger fitting closely up against the palm.

Second gnathopod (fig. 28) with basos expanded distally into a flange on the outer margin, ending in a rounded lobe at the extremity; ischium with a similar rounded process; merus short, its apex subacute; carpus very short, fitting closely into the emargination on the base of propod; propod large, oval, slightly narrowing distally, its anterior border regularly convex and smooth; palm oblique, longer than the hind margin, straight except for a rounded process near the base of the finger, fringed with a double row of short spinules and defined by two stout spines; finger stout, fitting into a small pocket at the end of the palm. Peræopoda one to five robust; propod slightly curved, especially in the last three pairs, its concave margin bearing at regular intervals three stout spinules of about equal size, all minutely serrated towards the end, but without a specially large serrated spine; posterior border of propod unarmed; finger strong, about half the length of the propod, much curved, inner setule very small; in the third peræopod (fig. 29) the basos is rounded, projecting inferiorly as far as the end of the ischium, in the fourth and fifth similar, but in the fourth the basos is slightly narrower than in the third and fifth; hind margins of basos in all either smooth or only faintly crenulate. Uropoda short, the first with peduncle about as long as the branches, and with two or three spinules along its lateral margins and a stout curved spine at the distal end; branches subequal, with lateral and terminal spinules. Second uropod similar, but with peduncle shorter than the branches. Third uropods with the branch rather shorter than the base, both with stout terminal spinules. Telson with a stout spinule on each half.

Female.—Similar to the male, except in the gnathopoda, which are shown in figs. 25 and 26.

I have been forced to make a new species for these specimens from South Africa, from which locality no species of *Hyale* appears to have been hitherto recorded. The species appears to come very close to *H. camptonyx* (Heller), from the Mediterranean and North Atlantic, but it differs in a few points mentioned in the description above, and particularly in the peculiar and apparently characteristic expansion of the first joint of the peduncle of the upper antenna. *H. schmidtii* (Heller), also from the North Atlantic, seems to be pretty closely allied also, but has the second antenna much longer.

In many respects the present species is similar to *H. media* (Dana), which is known from several localities on the borders of the Atlantic Ocean, but it seems to be clearly distinguished from that species by the absence of the "very large submedian serrate spine" on the propod of peræopoda 3 to 5.

Genus Haplocheira Haswell, 1879.

Haplocheira barbimana (G. M. Thomson).

Gammarus barbimanus G. M. Thomson, 1879, p. 241, pl. x.D, fig. 1.
Haplocheira barbimana Stebbing, 1906, p. 609.
" " Walker, 1907, p. 35.

South Orkneys, Scotia Bay, Station 325; 9–10 fathoms. May 1903. Five specimens.

The largest of these specimens is 7 mm. long. They agree closely with New Zealand specimens.

The species is widely distributed in southern seas.

Genus Eurystheus.

(?) *Eurystheus afer* (Stebbing). (Pl. II. figs. 30–34.)

Gammaropsis afra Stebbing, 1888, p. 1097, pl. cxiii.
Eurystheus afer Stebbing, 1906, p. 612.
" " " 1910B, p. 461.

Gough Island, Station 461; trawl, 100 fathoms. 23rd April 1904. Two small specimens: the one a male, 4 mm., probably immature; the other a female, 5 mm.

I refer these specimens to this species with considerable doubt; but if, as Mr Stebbing suggests, *E. atlanticus* is only a variety of this species, it appears to be a variable one, and it may perhaps be extended sufficiently to include forms now being considered. The male specimen probably has not acquired the fully adult characters.

The female specimen differs from Stebbing's description in having the eyes oval and of normal shape; the first gnathopod (fig. 30) has the carpus longer than the propod, and the whole limb is more slender; the second gnathopod (fig. 31) is also longer, the carpus is not cup-shaped but sub-triangular, widening distally, and is about

two-thirds as long as the propod. The third uropods have the branches equal in length and rather longer than the peduncle. In other respects the specimen agrees fairly well with STEBBING's description, and the lateral lobe of the head is acutely pointed as in that species.

The form that I consider the immature male differs from the female in the second gnathopods (fig. 33), which are of the same general shape, with a moderately long carpus but with the propod larger and stouter, its palm more oblique and bearing three short conical acute teeth, one near the base of the finger, one beyond the point on which the end of the finger impinges, and one midway between these two. The third and fifth peræopoda are peculiar in having the merus widely dilated so as to be fully half as broad as long (see fig. 34); in the fourth peræopod the merus is of the usual shape. Whether this expansion of the merus is a sexual character, or an individual variation in the particular specimen examined, I cannot say.

Genus JASSA.

Jassa falcata (Montagu).

Cancer (*Gammarus*) *falcatus* Montagu, 1808, *Trans. Linn. Soc.*, vol. ix. p. 100, pl. v. fig. 2.
Podocerus falcatus and *P. validus* Stebbing, 1888, p. 1132, pl. cxix., and p. 1135, pl. cxxxviii.B.
,, *ingens* Pfeffer, 1888, p. 131.
,, *australis* Haswell, 1880, p. 338, pl. xxi. fig. 8.
Jassa pulchella Stebbing, 1906, p. 654.
,, ,, Chilton, 1909A, p. 647.
,, *goniamera* Walker, 1903A, p. 61, pl. xi. figs. 98–106A.
,, *wandeli* Chevreux, 1906B, p. 94, figs. 54–56.
,, *falcata* E. W. Sexton, 1911, p. 212.

[I have given only the chief references relating to the occurrence of this species in southern seas. The very numerous references to its occurrence in the northern hemisphere can be readily traced from those here given.]

South Orkneys, Scotia Bay, Station 325, and Macdougal Bay, Station 326B. Several specimens of both sexes and of various ages.

Station 414, lat. 71° 50′ S., long. 23° 30′ W.; vertical net, from surface to 1000 fathoms. 15th March 1904. One specimen.

Mrs SEXTON, who has specially studied this species, believes that there are at least two different forms of the adult male.

When I came to examine the South Orkneys specimens it became quite clear that some of them were almost, if not quite, the same as the northern species, and that the males belonged to what Mrs SEXTON has described as the "second form." The males agree almost exactly in the characters given of the second antenna and of the gnathopods for this form; and females of this form were also present. As there are two forms known of this species in European seas, it was to be expected that, if the South Orkneys species was really the same species, the "first form" would also be found there. This actually proved to be the case, for two specimens from Macdougal

Bay agree almost exactly with Plymouth males of the first form. I have been able to compare my specimens with specimens of both forms determined by Mrs SEXTON, and she has been good enough to examine them along with me, and agrees that the South Orkneys specimens are not sufficiently distinct to be looked upon as a separate species.

I have also been able to compare my specimens with numerous forms labelled *Podocerus ingens* Pfeffer, from South Georgia, kindly sent to me by the authorities of the Hamburg Museum. Most of these appear to belong to the "first form," and agree closely with Plymouth specimens; they differ a little in the shape of the side plate of the second gnathopod, but the difference is slight, and there is a gap between this and the preceding side plate as described by Mrs SEXTON. The second gnathopod itself agrees almost precisely with Plymouth specimens, both in the fully mature form and in the immature stages. In the flagellum of the lower antenna the joints are usually a little more distinct than in typical Plymouth specimens, but in the South Georgia specimens there is some variation in this point; apparently the joints are more distinct in younger forms and become more fully coalesced in the older ones; they bear the characteristic plumose hairs as described by Mrs SEXTON. PFEFFER'S type of *Podocerus ingens*, which I have also been able to examine, is a very large specimen, 26 mm. in length. Though apparently belonging to the first form, it differs a little in the shape of the second gnathopod; the thumb is comparatively small, and at its base on the outer side there is a small secondary notch or tooth that does not seem to be represented in the smaller specimens labelled *Podocerus ingens*. It is possible that this large form may be a separate species, but I am inclined to think that it is only a very large form of *Jassa falcata*, and that the differences are merely those that we might expect to meet in such a very large form. *Jassa goniamera* Walker seems certainly to belong to *J. falcata*; the specimen he described and figured under this name is an immature male of the first form. He states that the third uropod bears no secondary teeth on the outer branch. In all the specimens that I have been able to examine I have found teeth present, as in the Plymouth specimens, though small; occasionally these may become lost in preserved specimens, and I presume that is what has happened in the specimens examined by Mr WALKER. *Jassa wandeli* Chevreux, again, appears undoubtedly to be another specimen of the same species; his figure 54 is taken from a male not quite fully mature, and shows the characteristic gap between the first and second side plates, while the lower antenna exactly corresponds, both in his figure and description, to that of the first form of the male. In the specimen he figures, the various joints of the flagellum appear to be slightly more completely coalesced than they are in some of the South Georgia and South Orkneys specimens, and thus more like Plymouth specimens of this form.

I have long been familiar with this species under the name of *Podocerus validus* Dana in New Zealand, and it has been described from Australia by Professor HASWELL under the name *Podocerus australis*. In his report on the *Challenger* Amphipoda Mr STEBBING recorded it from Kerguelen Island under the name *Podocerus falcata*,

and suggested that it had possibly been carried out from northern seas by attaching itself to the hull of the vessel. Though marine crustacea doubtless are occasionally dispersed in this way by ships, we now know that *Jassa falcata* is a cosmopolitan species, and its occurrence in Kerguelen Island can therefore be otherwise accounted for. It has been pointed out by Mr G. M. Thomson and myself that the animal often temporarily attaches itself to the carapace of large crustacea, such as *Jasus edwardsii* Hutton, and probably its dispersal is assisted in this way.

The brief notice I have given above gives only a faint idea of the complex forms of this species and of the changes it passes through. These forms and its full life history are being worked out by Mrs Sexton and others at the Marine Laboratory, Plymouth, and I have been greatly assisted in the identification of my specimens by the communication of some of the results already obtained but not yet fully published.

Genus Caprella Lamark, 1801.

Caprella æquilibra Say.

Caprella æquilibra Say, 1818, p. 391.
„ „ Mayer, 1903, pp. 75, 89, pl. iii. figs. 29–34, pl. vii. figs. 66–69.
„ „ Stebbing, 1910B, p. 466.

South Africa, entrance to Saldanha Bay, Station 483; trawl, 25 fathoms. 21st May 1904. One immature male.

The specimen is not fully mature, but I think undoubtedly belongs to this widely distributed species.

It is worthy of note that this is the only Caprellid taken during the expedition, and that the family seems to be quite absent from the Antarctic fauna, and only very poorly represented in the sub-Antarctic.

Genus Hyperia Latreille and Desmarest, 1823.

Hyperia gaudichaudii Milne Edwards.

Hyperia gaudichaudii Milne Edwards, 1840, vol. iii. p. 77.
„ „ Stebbing, 1888, p. 1394, p. 169.
„ „ Walker, 1907, p. 7.

Falkland Islands, Stanley Harbour, Station 118; "ectoparasitic on jelly-fish." 7th January 1903. Several males, females, and young; the largest female being 15 mm. long.

Station 541; 37° 41′ N., 29° 25′ W., surface; hand-net. 3rd July 1904. "Associated with Aurelia caught at the same time." Two males.

Station 112; surface, lat. 46° 3′ S., long. 56° 30′ W. 3rd January 1903. Many specimens, all of small size, the largest 6 mm.

These specimens all seem undoubtedly to belong to this widely distributed species, which has already been recorded from Antarctic regions by Mr Walker.

Genus Vibilia.

Vibilia antarctica Stebbing.

Vibilia antarctica Stebbing, 1888, pp. 1290, pl. cl.
„ *propinqua* Walker, 1907, p. 6.

Station 422, lat. 68° 32′ S., long. 12° 49′ W.; 8 ft. vertical net, surface to 800 fathoms. 23rd March 1904. Two specimens, 10 mm. long.

These specimens appear to be the adults of this species, which was described from an immature form by Mr Stebbing. Dr A. Behning, who has worked out the Vibilidæ of the German South Polar and other Expeditions, informs me that this species appears to be the typical Antarctic species, though extending also some distance north, and that it is very close to *V. propinqua*, but is distinguished by the long carpal process and the poor development of the eyes. I presume this is the same species as that recorded by Walker under the name of *V. propinqua* from the *Discovery* Expedition.

Genus Euthemisto.

Euthemisto thomsoni Stebbing.

Themisto antarctica G. M. Thomson, 1879, p. 243, pl. x.d, figs. 2 and 3.
Euthemisto thomsoni Stebbing, 1888, p. 1414, pls. cxxiv. and cxxv.
„ „ „ 1910b, p. 655.

Station 468, lat. 39° 48′ S., long. 2° 33′ E.; "trawl, 2645 fathoms." 29th April 1904. One specimen, doubtless obtained from the surface.

This specimen agrees closely with the description given by Stebbing in the *Challenger* Report, and I give it under the name that is used both there and in his recent report on the collections of the *Thetis* from Australia, without entering into discussion of the validity of the actual name.

IV. Tropical and North Atlantic Species.

Genus Synopia Dana, 1852.

Synopia schéeleana Bovallius.

Synopia schéeleana Bovallius, 1886, *N. Acta. Soc. Upsal.*, ser. 3, vol. xiii., No. 9, p. 16, pl. ii. figs. 22–29.
„ „ Stebbing, 1888, p. 799, pl. cii.
„ „ „ 1906, p. 272.
„ „ Chevreux, 1900, p. 64.

Station 62, Tropical Atlantic, lat. 4° 15′ S., long 33° 38′ W. 13th December 1901. Three or four small, delicate specimens, the largest 3 mm. long.

These specimens agree closely with the description and figures given by STEBBING in his *Challenger* Report.

The species is known from the warm waters of the Pacific and the Atlantic Oceans. It is perhaps not distinct from *Synopia ultramarina* Dana, with which it is united by DELLA VALLE.

Genus HYALE H. Rathke, 1837.

Hyale grimaldii Chevreux.

Hyale grimaldii Chevreux, 1891, p. 257, figs. 1–5, and 1900, p. 10, pl. ii. fig. 2.
„ „ Stebbing, 1906, p. 567.

St Vincent, Station 24; among seaweed on shore. 1st December 1902. One male and one female; the male 3 mm. long.

Although these specimens are too small for certain identification, I think they must belong to this species. The gnathopoda of the male agree well with CHEVREUX's description, having the flange on the side of the basal joint, as described, and the propod is of the same shape, though the rounded lobe on the palm near the base of the finger is not so well marked. The lower antennæ are hardly so stout as shown in CHEVREUX's figure.

The species was previously known from the North Atlantic.

Genus ALLORCHESTES Dana, 1849.

Allorchestes plumicornis (Heller).

Nicea plumicornis Heller, 1866, p. 5, pl. i. figs. 8 and 9.
Allorchestes plumicornis Stebbing, 1906, p. 583.
„ „ Walker, 1901, p. 299, pl. xxvii. figs. 20 and 21.
„ „ Chevreux, 1911, p. 241, pl. xvii. figs. 1–3.

St Vincent, Station 24; north-east beach. 1st December 1902. Four small specimens.

There is no fully developed male among these specimens, but from the characters of the females I think they must belong to this species. The largest is probably immature, as the upper antennæ have only eleven joints in the flagellum and the lower fourteen; about half the joints in the latter bear tufts of long sensory setæ, the tufts decreasing in size distally; there is also a tuft on the distal end of the last joint of the peduncle, but none on the other parts of the peduncle. The second gnathopod agrees well with WALKER's figure; the dactyl of all the peræopoda bears the prominent setule on the inner margin, and in the remaining characters the specimens agree well with the descriptions given by STEBBING and CHEVREUX.

The species is well known from various parts of the Mediterranean, but does not appear to have been recorded from St Vincent.

Genus SUNAMPHITOE Bate, 1857.

Sunamphitoe pelagica (Milne Edwards).

Amphithoe pelagica Milne Edwards, 1830, *Ann. Sci. Nat.*, vol. xx. p. 378.
Sunamphitoe pelagica Chevreux, 1900, p. 102, pl. xi. fig. 4.
" " Stebbing, 1906, p. 645.

St Vincent, Station 24; north-east beach. 1st December 1802. One female, 5 mm. long.

Gulf Weed, Station 538, lat. 32° 11′ N., long. 34° 10′ W.; surface. 30th June 1904. Several of both sexes, largest about 6 mm. long.

These specimens agree in all essential respects with the descriptions given by STEBBING and CHEVREUX.

The species is widely distributed in the North Atlantic, but I know of no previous record from St Vincent.

Genus ANCHYLOMERA.

Anchylomera blossevillii Milne Edwards.

Anchylomera blossevillii Milne Edwards, 1830, *Ann. Sci. Nat.*, vol. xx. p. 394.
" " Stebbing, 1888, p. 1433, pl. xvii.
" " Chevreux, 1900, p. 147.

Station 62, Tropical Atlantic, lat. 4° 15′ S., long. 33° 38′ W.; tow-net. 13th December 1902. One specimen.

Station 57, Tropical Atlantic, 2° 1′ S., 32° 18′ W.; tow-net. 12th December 1902. Four specimens, 4 mm. long.

This is a common species in the warmer parts of the Atlantic Ocean.

Genus OXYCEPHALUS Milne Edwards, 1830.

Oxycephalus clausi Bovallius.

Oxycephalus clausi Bovallius, 1887, p. 35.
" " Stebbing, 1888, p. 1578, pl. cci.
" " Chilton, 1911, p. 567.

Station 40, Tropical Atlantic, lat. 5° 57′ N., long. 25° 56′ W. 7th December 1902. One specimen.

This specimen agrees very closely with those described and figured by STEBBING from the *Challenger* Expedition, and it is also the same as specimens from the Kermadec Islands examined by me in 1911.

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[VI. EXPLANATION OF PLATES,

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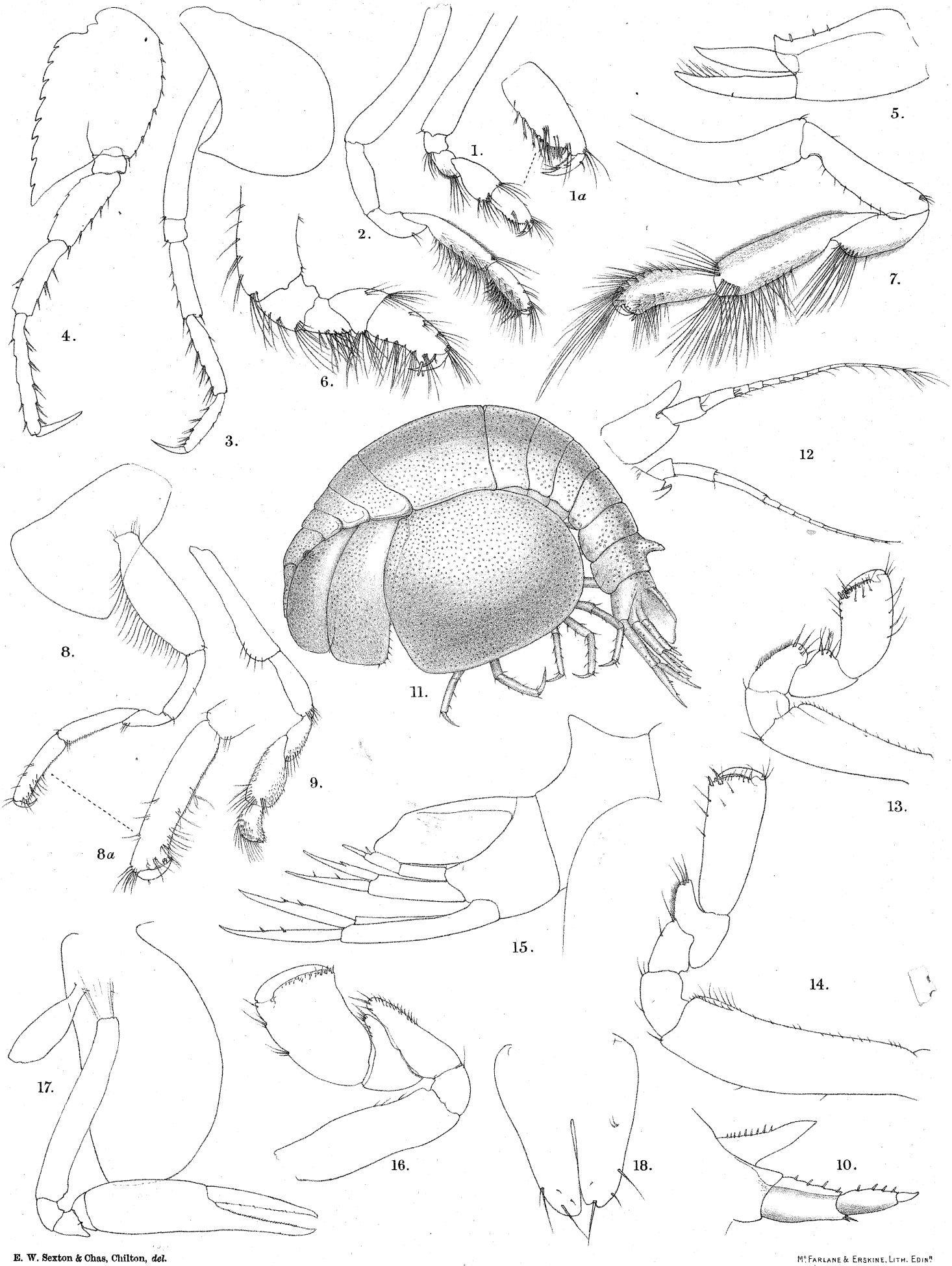
Plate I.

Fig. 1. *Cyphocaris anonyx* Boeck. First gnathopod.
,, 1*a*. ,, ,, ,, ,, extremity more highly magnified.
,, 2. ,, ,, ,, Second gnathopod.
,, 3. ,, ,, ,, Second peræopod.
,, 4. ,, ,, ,, Third peræopod.
,, 5. *Lysianassa cubensis* Stebbing. Third uropod.
,, 6. *Alicella scotiæ*, sp. nov. First gnathopod.
,, 7. ,, ,, ,, Second gnathopod.
,, 8. *Orchomenopsis* (?) *coatsi*, sp. nov. First gnathopod.
,, 8*a*. ,, ,, ,, ,, extremity more highly magnified.
,, 9. ,, ,, ,, Second gnathopod.
,, 10. *Metopoides sarsii* Pfeffer. Last segment of urus, with third uropod and telson.
,, 11. *Thaumatelson walkeri*, sp. nov. Side view.
,, 12. ,, ,, ,, Antennæ.
,, 13. ,, ,, ,, First gnathopod.
,, 14. ,, ,, ,, Second gnathopod.
,, 15. ,, ,, ,, Urus, with uropoda and telson.
,, 16. ,, *inermis*, sp. nov. First gnathopod.
,, 17. ,, ,, ,, Second gnathopod.
,, 18. *Atyloides magellanica* (Stebbing). Telson of specimen, showing unsymmetrical lobes.

Plate II.

Fig. 19. *Acanthonotozoma australis*, sp. nov. Side view of whole animal.
,, 20. *Eusirus splendidus*, sp. nov. Side view of whole animal.
,, 21. *Atyloides calceolata*, sp. nov. Basal joints of antennæ.
,, 22. ,, ,, ,, First gnathopod.
,, 23. ,, ,, ,, Second gnathopod.
,, 24. *Hyale saldanha*, sp. nov. Anterior portion of head of female, with antennæ.
,, 25. ,, ,, ,, First gnathopod of female.
,, 26. ,, ,, ,, Second gnathopod of female.
,, 27. ,, ,, ,, First gnathopod of male.
,, 28. ,, ,, ,, Second gnathopod of male.
,, 29. ,, ,, ,, Third peræopod of male.
,, 30. (?) *Eurystheus afer* (Stebbing). First gnathopod of female.
,, 31. ,, ,, ,, Second gnathopod of female.
,, 32. ,, ,, ,, First gnathopod of male.
,, 33. ,, ,, ,, Second gnathopod of male.
,, 34. ,, ,, ,, Third peræopod of male, with widened merus.

CHILTON: "SCOTIA" AMPHIPODA.—PLATE I.



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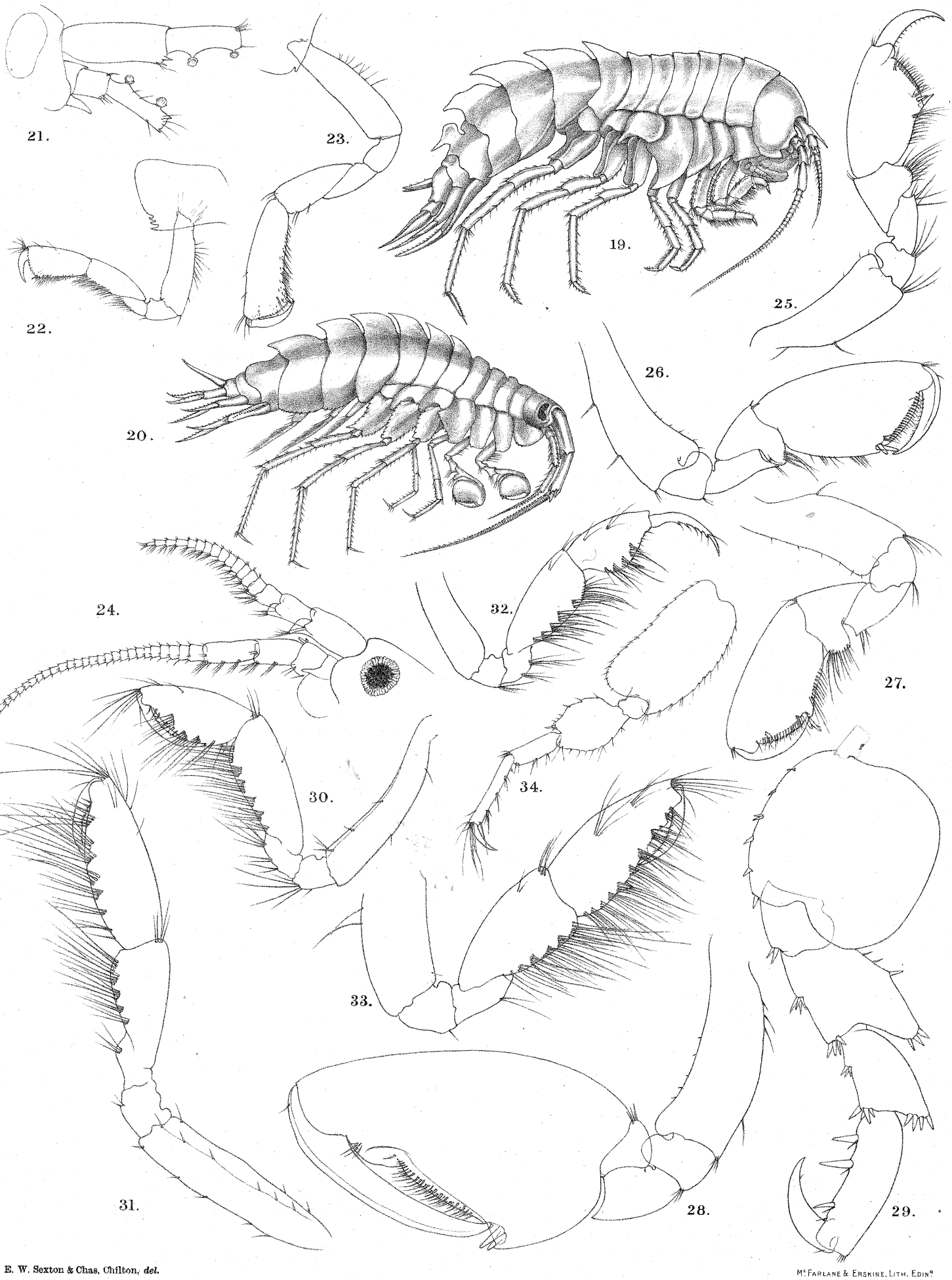
CHILTON: "SCOTIA" AMPHIPODA.—PLATE II.



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