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With the Authors Compliments
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VIII.—NOTES ON GATHERINGS OF CRUSTACEA COLLECTED BY THE FISHERY STEAMER "GARLAND," AND THE STEAM TRAWLERS "STAR OF PEACE" AND "STAR OF HOPE," OF ABERDEEN, DURING THE YEAR 1901.

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(Plates XXII.—XXV.)

In continuation of my notes on the new and rare Crustaceans which have been obtained in tow-net gatherings, and in gatherings of dredged and other materials collected at different times and in various places during the past year, I have to acknowledge my indebtedness to the Naturalist on board the Fishery steamer "Garland," and to Mr. Dannevig and others who have carried on from time to time a considerable amount of interesting fishery research work during 1901. The collections of Crustacea forwarded to the Laboratory at Bay of Nigg, in connection with these investgations, have in a number of instances proved to be extremely interesting. Several apparently undescribed forms have been obtained, while others, though they may have been recorded elsewhere, have not previously been obtained in Scottish waters. Moreover, the distribution of a number of rare species described in former papers has by these researches been still further extended.

A number of rare Crustaceans—Copepods and others—have occurred in gatherings collected by the "Garland" in the Firth of Forth on the East of Scotland, and in Loch Etive on the West Coast. Other rare forms have been obtained in gatherings collected by the steam trawler "Star of Peace" while working to the east and north of the Shetland Islands; and one or two species, rarely met with, were also captured in deep water (58 to 65 fathoms) about nine to ten miles to the eastward of Aberdeen by the steam trawler "Star of Hope."

There is one point in connection with these investigations which seems to be of peculiar interest, and which it may not be out of place to refer to here; it is this, that localities which have already been subjected to prolonged and careful examination should still continue to yield not only rare but even new forms of life. I do not refer to those minute microscopical species which are difficult to distinguish, and which may easily be overlooked even by those who have acquired a fairly extensive and special knowledge, but species which from their size and shape or colour are sufficiently conspicuous to attract the attention of even the casual observer. Whether these forms, which are turning up in places where they have not been seen before, are recent or new arrivals, or whether they have escaped notice hitherto owing to their distribution being limited to some particular area more or less out of the reach of the dredge or the tow-net, and that, having for some reason left their old haunts, and made their way to a place more accessible, have ultimately been captured, is a question that may not be easily answered. The following two examples will indicate more clearly the aspect of the question concerning the distribution of species to which I refer:—

For many years previous to 1886-87, when arrangements were made by the Fishery Board for the scientific investigation of the Firth of Forth, special efforts had from time to time been put forth by not a few eminent

naturalists to study the invertebrate fauna of the Forth estuary, and a considerable number of species of Crustacea, including several Schizopods, were made known to science, yet none of these investigators appears to have noticed *Erythrops goesii*, G.O.S. (= *E. erythrophthalmus*, Goes). Now this Schizopod, though probably one of the largest of the species belonging to the genus *Erythrops*, is under half an inch in length, and might on account of its small size be overlooked by an ordinary observer, but, like its confrères, it possesses eyes of such a brilliant red colour as to make the little creature quite conspicuous even in a crowded tow-net gathering, especially if the gathering be examined soon after it is collected; it is therefore scarcely likely that this *Erythrops* would have escaped being noticed by naturalists so experienced as Goodsir, Henderson, Leslie, and others, had it been present in any of their collections. Other and less conspicuous Schizopods were recorded by these early investigators: then why not this one? When, on the other hand, we turn to the work of the Fishery steamer "Garland," as described in the various Annual Reports of the Board, we find that mention is made of *Erythrops* as early as October 3rd, 1888, when it was obtained in a bottom tow-net gathering collected at Station V.,* while in a paper on the fauna of the Firth of Forth published in 1889 *Erythrops goesii* is described as "frequent all over the Forth from Inchkeith to May Island,"† and as being new to Britain; but since that time it has been found to be of moderately common occurrence, especially in the part of the Firth described above. The question which naturally suggests itself here is—Was the recognition of *Erythrops* in the Firth of Forth in 1888, and every year since, the result of a recent migration of the species, or had it simply been overlooked by former observers?

The second example is even more interesting than the one just referred to—viz., the occurrence of *Calocaris macandreæ* in the Firth of Forth. *Calocaris* was for a long time considered to be a rare species and to have a very limited distribution; subsequent investigations have shown, however, that its distribution is not so restricted as it was formerly believed to be; but till as recently as the past summer it had never been known to occur in the Firth of Forth, notwithstanding the fact that the Crustacean fauna of that estuary has been very carefully examined by the various methods of tow-netting, dredging, and trawling, as well as by the examination of the organisms contained in the stomachs of fishes captured within its limits. About the end of May of the present year (1901), when the Fishery steamer "Garland" was engaged in carrying on some special work, a number of specimens of the Crustacean referred to were obtained, along with several other organisms, at Station III.—to the east of Inchkeith—in a small-mesh net which was being employed for the capture of small fishes; and it was also about the same time obtained in the stomach of a Long Rough Dab, *Drepanopsetta platessoides*, from about the same place. Other specimens of *Calocaris* were obtained by Mr. Pearcey, the Naturalist on board the "Garland," in the stomachs of large Witch Soles, *Pleuronectes cynoglossus*, captured on the 28th of June and 15th July at Station V.—to the west of May Island—in 25 to 27 fathoms. These various captures of *Calocaris* within such a short time would almost warrant the belief that this Crustacean was not uncommon in the Firth of Forth; and should that be found to be really the case, the fact that no trace of the species had been noticed by any previous observer is of considerable interest. Of course, if the species be of true fossorial habits—and any evidence we have concerning it seems to support such a con-

* Seventh Annual Report of the Fishery Board for Scotland (1889), Part III., p. 57.
† Op. cit., p. 322.

clusion—it might easily escape capture by the dredge or the trawl by burrowing deep into the soft mud which forms the floor of the more central portion of the estuary of the Forth; but its occurrence in the stomachs of the Long Rough Dab and the Witch Sole indicates that it does not always remain in hiding, but occasionally comes to the surface of the mud in which it burrows, and though it may have escaped being captured by the dredge or the trawl, it apparently does not always escape the fishes that happens to be on the look-out for food, yet we can find no reference to its ever having been observed even in the stomachs of fishes taken within the estuary. *Calocaris* is considered to be somewhat sluggish in its habits, because specimens are occasionally found overgrown with a small zoophyte; but such habits should make its capture by trawl or dredge of more easy accomplishment. Moreover, it is not such a small species as to be easily passed over, and it is sufficiently distinct that any one with a fair knowledge of the Crustacea would be likely to recognise it as different from the more common forms, yet the fact remains that not one of the many students who have investigated the Crustacean fauna of the Firth of Forth appears to have obtained any evidence to lead them to regard it as even of doubtful occurrence within the limits of the estuary.

Whether *Calocaris* be a recent introduction or not, there is apparently no doubt as to its having now a right to be reckoned amongst the Crustacean fauna of the Forth.

The number of Crustacea recorded in the present paper is scarcely so large as in that published last year, but there are included several species apparently undescribed, and others which are new or rare in the Scottish seas. The following are the more interesting of the species recorded:—

Xanthocalanus (?) *borealis*, G. O. Sars.
(?) *Phænna zetlandica* T. Scott (sp. n.)
Scolecithrix (?) *brevicornis*, G. O. Sars.
Platypsyllus minor, T. Scott (gen. et sp. n.).
Nereicola concinna, T. Scott (sp. n.).
Stenhelia confusa, T. Scott (sp. n.).
Ameira tenuicornis, T. Scott (sp. n.).
Ameira propinqua, T. Scott (sp. n.).
Pseudomesochra longifurcata, T. Scott (gen. et sp. n.).
Leptopontia curvicauda, T. Scott (gen. et sp. n.).
Normanella attenuata, A. Scott.
Fultonia hirsuta, T. Scott (gen. et sp. n.).
Monstrilla longiremis, Giesbrecht.
Thaumaleus thompsoni, Giesbrecht.
Pseudopsyllus elongatus, T. Scott (gen. et sp. n.).
Acontiophorus ornatus (Brady and Robertson).
Cancerilla tubulata, Dalyell.
Salenskya tuberosa, Giard and Bonnier.

It will be observed from the above list that five new genera and ten new species are described in the present paper. There were a few other interesting organisms observed, such as *Arca pectunculoides* and *Cadulus subfusiformis* (two species of Mollusca), but valves only of the first, and a recently dead specimen of the other, were obtained.

The following is a detailed description of the more interesting of the species of Crustacea observed in the numerous gatherings examined during the year:—

CRUSTACEA.

Sub-Class ENTOMOSTRACA.

Order I.—COPEPODA.

Calanidæ.

Calanus hyperboreus, Kröyer.

1838. *Calanus hyperboreus*, Kr., Danske Selsk. Afh., vol. 7 p. 310, t. 4.

A few specimens were obtained in a gathering collected about 22 miles to the north of Shetland on May 17th, 1901. One or two specimens were also found in another gathering collected to the east of the Shetland Islands on the 22nd of the same month, and as both these localities are within the British area, this northern *Calanus* is entitled to be regarded as a member of the copepod fauna of the British Islands. This appears to be the only *Calanus* in the North Atlantic or Arctic seas in which the last segment of the thorax has the postero-lateral margins distinctly angular. The size of specimens appears to vary a good deal, but one or two of the largest of those now recorded measured one-fifth of an inch (5 mm.) in length.

Rhincalanus (?) *gigas*, Brady.

I have again to record this copepod from the Moray Firth. It does not appear to differ much except in size from the form described by Dr. Brady under the name given above.

Pseudocalanus elongatus, Boeck.

I include this common species in these notes in order to mention the occurrence of a form somewhat smaller than the ordinary one. These two forms have been observed in the Firth of Forth and in the Moray Firth as well as off the Aberdeenshire coast. They were first noticed a good many years ago, and they are still occasionally noticed. Though the two forms have been carefully examined no important difference has been observed between them.

Stephus minor, T. Scott.

1892. *Stephus minor*, T. Scott, 10th Ann. Rept. Fishery Board for Scot., pt. iii., p. 245, pl. vii., figs. 1, 2, 10–13.

This species occurred in a bottom gathering from Smith Bank, Moray Firth, collected on February 15th, 1901, at a depth of about 24 fathoms. *Stephus minor*, though apparently widely distributed, seems to be a rare species, as seldom more than one or two specimens are obtained in any single gathering.

Stephus scotti, G. O. Sars.

1896. *Stephus gyrans*, T. Scott (not Giesbrecht), 15th Ann. Rept. of the Fishery Board for Scot., pt. iii., p. 146, pl. ii., fig. 9, pl. iii., figs. 17, 18.

Recently, when re-examining some copepoda collected in the Firth of Forth in 1892, I obtained a single female specimen of this species.

This is the first time the species has beeen observed on the east coast, but on the west coast it has been taken in Loch Fyne and in the Sound of Mull; it appears to be a very scarce species. Prof. G. O. Sars informs me *in lit.* that this species has long ago been found by him off the Norwegian coast, and that, though the female resembles somewhat the female of *Stephus gyrans*, Giesbrecht, the male (which I have not seen) differs very considerably from the male of the form described by that author. He also informs me that the name he proposes for this species is *Stephus scotti*, a full description of which will be found in vol iv of his work on the Crustacea of Norway, now in course of publication.

Pseudocyclopia caudata, T. Scott.

1894. *Pseudocyclopia caudata*, T. Scott, 12th Ann. Rept. Fishery Board for Scot, pt. iii., p. 236, pl. v., figs. 1–8.

This is a smaller and rarer species than *Pseudocyclopia crassicornis*; it has been taken in the Firth of Clyde as well as in the Firth of Forth, and I now record its occurrence in the deep water (60 fathoms) about 10 miles off Aberdeen, where it was collected on July 30th, 1901. In this species the caudal furca are distinctly more elongate than in the other described species.

Ætidius armatus, Brady.

The female specimen of a copepod which I regard as identical with the species described by Dr. Brady under the above name in his Report on the Challenger Copepoda, occurred in a mid-water tow-net gathering collected off the east side of the Shetland Islands on May 22nd, 1901. Professor Sars, in his new work on the Copepoda of Norway, remarks that the *Pseudocalanus armatus* of Boeck is probably identical with the *Ætidius armatus* described by Professor G. S. Brady, and if so, the name of the species would stand as *Ætidus armatus* (Boeck).

Bradyidius armatus (Vanhöffen).

1878. *Pseudocalanus armatus*, Brady (not Boeck), Brit. Copep., vol. i., p. 46, pl. iv., figs. 1–11.

1899. *Bradyidius armatus* (Vanhöffen). *Vide* Das Tierreich, p. 32.

(?) 1884. *Undinopsis Bradyi*, G. O. Sars, in Sp. Schneider's Rept. of Invertebrata from the Kvænangen Fjord.

A set of drawings showing the structural differences between the male and female of this species, with descriptive notes, was published in the 14th Annual Report of the Fishery Board for Scotland. It is a species that is of frequent occurrence in the Clyde, where it was first obtained by Dr. Brady many years ago, and it is also found on other parts of the Scottish coasts—its distribution extending to the north of the Shetland Islands, where it was collected on the 17th of May of the present year (1901). *Undinopsis Bradyi*, G. O. Sars, may be identical with this species, but it differs somewhat in the structure of the fifth thoracic feet of the male.

Scolecithrix hibernica, A. Scott.

1896. *Scolecithrix hibernica*, A. Scott, Ann. and Mag. Nat. Hist., (6), vol. 18, p. 362, pl. xvii., figs. 1–9; pl. xviii., figs. 1–9.

This species was obtained in Loch Etive in about 60 fathoms on September 17th, 1901; Loch Etive is a new station for this *Scolecithrix*.

(?) *Scolecithrix brevicornis*, G. O. Sars. Pl. XXV., figs. 1 and 2.

1900. *Scolecithrix brevicornis*, G. O. Sars, The Norw. N. Polar Exped. (1893–96), p. 49, pl. x.

Description of the Male.—Length 1·5 mm. (about $\frac{1}{17}$ of an inch). Body viewed from above, elongate-oval; equal to rather more than two-thirds of the entire length, widest behind the middle. The anterior somite is equal to nearly twice the entire length of the next three: abdomen, slender, scarcely half as long as the thorax. Antennules moderately short, scarcely reaching to the first abdominal segment, the first seven joints very short, the eighth to the (?) twelfth coalescent, the remaining joints somewhat similar to those of the female.

The fifth thoracic feet were slightly damaged, and the following description of them is to some extent imperfect. The left leg is composed of four joints, the first is swollen but scarcely as long as the next, the third and fourth, which are sub-equal, are also rather shorter as well as being more slender than the second. The right leg consists of three (? or four) joints, the first and second are moderately elongate, the third is somewhat shorter and narrower, alongside of third joint and articulated with it to the end of the second is a slender branch-like appendage equal in length to the third joint (fig. 2).

Habitat.—Collected about sixty miles to the east of the Shetland Islands on May 22nd, 1901. In the same gathering were obtained *Metridia longa*, *Xanthocalanus* (?) *borealis*, and one or two other rare copepods. The copepod which I have provisionally ascribed to *Scolecithrix brevicornis* agrees with the female described by Professor G. O. Sars in its general form, in the proportional lengths of the thoracic segments, and in the comparatively short antennules. Sars did not obtain the male of his species, and there is therefore some uncertainty as to whether our specimen belongs to that species or not. This gathering was from moderately deep water.

Xanthocalanus (?) *borealis*, G. O. Sars. Pl. XXII., figs. 8 and 9.

1900. *Xanthocalanus borealis*, G. O. Sars, Crust. of Norw. N. Polar Exped., p. 49, pl. xi.

A female specimen of a *Xanthocalanus* was obtained in a tow-net gathering collected to the eastward of the Shetland Islands on May 22nd, 1901. It was thought at first that this specimen might belong to the *Xanthocalanus minor*, Giesbrecht, but on a careful comparison of it with the description and figures of that species and with the description and figures of G. O. Sars' *Xanthocalanus borealis* it was found to agree much better with the latter than with the former species. Prof. G. O. Sars, in the portion of his new work on the Crustacea of Norway, just published,* gives a figure of the fifth pair of thoracic feet of a slightly immature female, which agrees fairly well with the drawing of the fifth pair of the Shetland specimen (fig. 9).

This specimen (fig. 8) measures 2·89 mm. (rather less than an eighth of an inch) in length. The cephalothorax is moderately robust, and when viewed from above the width is seen to be equal to more than a third of its entire length, the sides are evenly rounded, and the posterior thoracic segment is produced on each side into acute angular processes which reach beyond the middle of the first abdominal segment. A minute seta springs from each side of the second-last thoracic somite.

*Crustacea of Norway, by G. O. Sars, vol. iv. (Copepoda), parts iii. and iv. (1902), p. 46, pl. xxxi., xxxii.

The abdomen is narrow and short, being scarcely more than a fifth of the entire length of thorax and abdomen.

The caudal furca are very short. No furcal setæ are shown in the figure, as they had all been broken off.

The fifth pair of thoracic feet are of moderate size, the first joint is equal to rather more than half the length of the second one, and is slightly gibbous on the interior aspect, the inner margin is also densely fringed with minute hairs; the second joint is slightly distorted, being bent inward somewhat abruptly near the middle; this joint is armed with three moderately stout setiferous terminal spines, and is also furnished with a few minute setæ on the lateral aspect and near where the joint is bent as shown in the drawing (fig. 9).

The occurrence of *Xanthocalanus borealis* in the neighbourhood of the Shetland Islands adds another species to the copepod fauna of Scotland. The distribution of this species appears to be somewhat restricted, as, with the exception of a single young female obtained in a gathering collected north of the New Siberian Islands, Prof. Sars has only found it in Stavanger Fjord, and in a few other places off the west coast of Norway, but its occurrence in this Shetland gathering seems to indicate that it may after all have an extensive distribution.

Phænna zetlandica, sp. n. Pl. XXII., figs. 5–7.

A male specimen of a (?) *Phænna*, which I have provisionally named *P. zetlandica*, was obtained in the same gathering with the *Xanthocalanus* just described, agrees in some respects very closely with *Phænna spinifera*, Claus, and may probably be only a form of that species. The specimen (fig. 5) measures nearly two and a half millimetres ($\frac{1}{10}$ of an inch) in length. The thorax is moderately robust, and when seen from above is broadest behind the middle. The cephalo-thoracic segment, which is about equal to half the entire length of the animal, tapers gradually to the broadly rounded forehead, the next-three thoracic segments are short. The abdomen is narrow, and its length is equal to little more than a third of that of the cephalo-thorax; it consists of five segments, the genital segment is slightly longer than any of the others, the last is very short; the caudal furca are very short (the furcal hairs are not shown, as they had accidentally been broken off).

The antennules, which appear to be the same on both sides, do not reach to the end of the abdomen, the first six joints are short, the seventh, eighth, and ninth are partly coalescent, the tenth to the fifteenth joints, which are of moderate length, are sub-equal, the seventeenth joint is also nearly equal to these in length, but the remaining joints are rather shorter; the antennules are only sparingly setiferous, as shown by the drawing (fig. 5).

The fifth pair of feet, in which both branches are developed, are very similar to those of *Phænna spinifera*, Claus. The right branch is elongated and slender and composed of four joints, the first three are of nearly equal length, but the last is about one and a half times the length of the preceding joint and considerably attenuated so as to resemble a spine rather than a joint (fig. 6). The left branch is rather longer than the right one and apparently five-jointed; the terminal portion of this branch consists of two appendages, the inner one being short and moderately broad, rounded at the end and fringed with setæ, the other is narrow and longer than the inner one and forms with it a kind of finger and thumb-like arrangement, as shown in figure 7.

The fifth thoracic feet of this Shetland specimen are seen to differ

somewhat from the fifth pair of the male of *Phænna spinifera*, Claus, especially in the terminal part of the left branch, when compared with the figure of the male fifth pair in Dr. Giesbrecht's work *; and I have therefore provisionally retained it under a separate specific name.

Centropagidæ.

Metridia longa (Lubbock). Pl. XXII., figs. 1–4.

One or two specimens of Lubbock's *Metridia (Calanus) longa* were found in a gathering collected about 22 miles to the north and in another collected about 60 miles to the east of the Shetland Islands; the first was collected on May 17th, and the other on May 22nd, 1901. One of the largest specimens taken in the first gathering measured 4 mm., or about one-sixth of an inch in length. The male and female specimens represented by the drawings (figs. 1 to 4) were obtained in the second of the two gatherings mentioned above; this female, which is scarcely so large as the largest specimen found in the first gathering, measured about 3·7 mm. and the male 2·8 mm. in length. The fifth pair of thoracic feet of the male and female, as represented by the figures 3 and 4, are practically identical with the figures of the same appendages given by Dr. Giesbrecht.†

Metridia lucens, Boeck.

This species was moderately frequent in the same gatherings with the last, as well as in gatherings from the Moray Firth and from other parts of the Scottish coasts.

Pseudocyclopidæ.

Pseudocyclops obtusatus, G. S. Brady.

One or two specimens of this curious species occurred in the washings of some dredged material from the north-west end of Inchkeith, Firth of Forth, collected on May 23rd, 1901. *Pseudocyclops obtusatus* has already been recorded from the Forth estuary, but has not been very often met with.

Pontellidæ.

Acartia bifilosa, Giesbrecht.

Acartia bifilosa was obtained along with the two species of *Metridia* mentioned above in the gatherings from the north and east of Shetland, and also in gatherings from the Firth of Forth recently collected.

Cyclopidæ.

Oithona (?) *setiger*, Dana.

Several specimens of an *Oithona* which I ascribe to *Oithona setiger*, Dana, occurred in a tow-net gathering from the Firth of Forth collected on April 22nd, and also in a similar gathering collected to the east of the Shetland Islands on the 22nd of May, 1901. In these specimens the rostrum, which projects forward instead of downward as in *O. helgolandica*, Claus (*O. similis*, Giesbrecht), tapers gradually to an acute

* Fauna u. Flora d. Golfes v. Neapel, vol. 19, p. 293, t. 12, fig. 5.
† Pelagischen Copepoden des Golfes von Neapel, pl. 33, figs. 20 and 23.

point, and not abruptly as in *O. plumifera*, Baird. This same *Oithona* was recorded from the Firth of Forth in 1891 under Dana's name—*Oithona setiger*.*

ASCIDICOLIDÆ.

Doropygus normani, G. S. Brady.

1898. *Doropygus normani*, G. S. Brady, Mon. Brit. Copep., vol. i., p. 136, pl. xxxii., figs. 1–14.

This large and distinct species was obtained in some material dredged in 8 fathoms off the North Craig, Firth of Forth, on July the 4th, 1901. Though the branchial chamber of the larger ascidians is the usual habitat of this species, it sometimes happens that the test of the ascidian is ruptured by the dredge, and the copepods that may be contained within the branchial chamber are then set free. Probably this may explain the reason why the specimens of a somewhat peculiar type of copepod, which I now describe, were obtained "free" amongst the same dredged material from the North Craig in which the *Doropygus* occurred.

Platypsyllus, T. Scott (gen. nov.).

Body flat and sub-ovate. Antennules rudimentary. Antennæ (?) obsolete. Mouth consisting of a small suctorial tube. Mandibles, maxillæ, and maxillipeds (?) obsolete. No thoracic feet observed. Abdomen scarcely distinguishable from the thorax. Ovisacs two, elongated.

Platypsyllus minor, T. Scott (sp. nov.). Pl. XXV., figs. 15–16.

Description of Female.—Length 1·7 mm. (nearly $\frac{1}{15}$ of an inch) in length. Body, seen from above, flat, oblong-ovate, greatest width near the posterior end, but the form varies somewhat in different specimens. Colour (after a short immersion in alcohol), opaque-white. Antennule obsolete or nearly so, reduced to a minute lobe on each side of the forehead, and bearing one or two extremely minute setæ. Antennæ obsolete. Mouth suctorial, and consisting of a small trumpet-shaped tube (fig. 16). Mandibles and other mouth appendages wanting. Thoracic feet also wanting. Abdomen indistinct from thorax. Ovisacs two, elongated, and containing numerous small ova; each ovisac originates from a small lateral angular process at the posterior end of the body (fig. 15).

Habitat.—Vicinity of North Craig, Firth of Forth, dredged in 8 fathoms on July 4th, 1901. No males have been observed.

Remarks.—The first specimens of this curious copepod observed were without ovisacs, and from their shape, their colour, and the apparent entire absence of appendages, there was at first considerable doubt regarding them, but ere long a specimen turned up with two long ovisacs attached to it, and then their true character was revealed.

From the simple and unarmed structure of these copepods it is fairly evident, I think, that if they are not commensals of some ascidian they must receive from some other host the shelter and protection necessary to organisms apparently so helpless as these animals seem to be.

Nereicola concinna, T. Scott (sp. nov.). Pl. XXV., figs. 8–14.

Description of the Female.—Length, 1·6 mm. (about $\frac{1}{16}$ of an inch) Body considerably dilated, rather more than one and a half times longer

* Ninth Annual Report of the Fishery Board for Scotland, Part III., p. 301.

than broad, widest in the middle. The cephalo-thoracic segment scarcely distinct, being indicated by a simple constriction; thoracic segments all coalescent. Abdomen very small, and apparently consisting of two somites; the first somite is short but moderately broad; the second is also short, and tapers abruptly to the slightly bilobed extremity. Caudal furca extremely small. Ovisacs (two) large (fig. 8).

The antennules are short, moderately slender, and five-jointed; the first and the last three are sub-equal in length, but the second is about one and a half times the length of the third; all the joints are sparingly setiferous (fig. 9).

The antennæ are short and three jointed, the end joint is armed with one small marginal and three or four stout terminal spines, which are slightly hooked (fig. 10); they are not provided with secondary branches.

The mandibles are large and elongated; proximally they are somewhat dilated, but they taper gradually to the distal extremity, where they are armed with two rows of short but stout tooth-spines as shown in the drawing (fig. 11). No maxillæ could be observed.

The first and second maxillipeds are very stout but of a somewhat rudimentary structure; the terminal claws are very short, but stout and tooth-like (figs. 12, 13). No thoracic feet were observed.

Habitat.—Parasitic on specimens of a marine annelid, *Eulalia viridis* Œrsted, dredged by the "Garland" in 55 to 65 fathoms in Loch Etive, west coast of Scotland, on September 17th, 1901. Several specimens, including old and young, were observed; one or two of the specimens occurred still adhering to fragments of the annelid, on which they appeared to be able to take a very firm hold.

At first I was not sure but that these Loch Etive specimens might belong to the same species as those found by Professor M'Intosh on *Nereis cultrifera*, Grube,* on the shores of the Channel Islands. I therefore sent a specimen to him for his opinion as to whether it was the same as those he had discovered; in replying to me he pointed out certain differences observed by him, and also very kindly sent me an example of the form from the Channel Islands so that I might more easily observe the differences he referred to. He stated further that the form found by him was the *Nereicola ovata* described by Keferstein in 1860.† I am also indebted to Professor M'Intosh for the name of the annelid from Loch Etive on which the copepods described here were obtained.

The difference in the form of immature specimens of *Nereicola concinna* from that of similar specimens of *N. ovat* is even more marked than in the adults (fig. 14).

Harpacticidæ.

Eucanuella spinifera, T. Scott.

1901. *Eucanuella spinifera*, T. Scott, 19th Ann. Rept. Fishery Board for Scotland., pt. iii., p. 245, pl. xviii., figs. 1–10.

This species, described in Part iii. of the 19th Annual Report, has again been observed in a gathering of bottom material collected to the east of the Shetland Islands in 60 to 70 fathoms on May 22nd, 1901. *Eucanuella* is apparently a deep-water species.

* On a Crustacean parasite of *Nereis cultrifera*, Grube, by W. C. MacIntosh, M.D., *Micr. Journ.*, vol. x., N.S., p. 39, pl. v.

† Zeit. f. w. Zool., bd. xii. (1860), taf. xliii., f. 1–4, p. 461.

Ectinosoma melaniceps, Boeck, (?) var. Pl. XXII., figs. 10–16.

1864. *Ectinosoma melaniceps*, Boeck, Overs. Norg. Copep., p. 20.

A few specimens of an *Ectinosoma* obtained in some dredged material from Station VI., Firth of Forth, have such a general resemblance to *Ectinosoma melaniceps*, Boeck, that though they differ in some details of structure they may after all be only a form of that species. The following description will indicate a few of the more important points of difference:—

The antennules are six-jointed, the basal joint appears to be the largest, being nearly twice the length of the next one, but the others are comparatively small (fig. 11). The antennæ appear to be similar to those of *Ectinosoma melaniceps*. The mandibles and mandible-palps are slender (fig. 12). The other mouth organs and swimming feet are somewhat similar to the same appendages in *E. melaniceps* (figs. 13, 14).

The fifth pair of the present form have the basal joints not very broad, the inner produced part scarcely reaches to the middle of the secondary joints, and is abruptly truncate at the apex; a short and a moderately long seta spring from the apex, the inner seta being the longest. The secondary joints are sub-cylindrical, and about one and a half times longer than broad; they are furnished with three terminal setæ, the middle one, which springs from a slightly produced lobe, is considerably longer than the other two; a small lateral hair is observed between the elongated middle seta and the outer one as shown in the figure (fig. 15). No males were observed.

Stenhelia ima, G. S. Brady.

1872. *Canthocamptus imus*, Brady, Nat. Hist. Northumb. and Durham, vol. iv., p. 432, pl. xix., figs. 1–5.

This species occurred very sparingly in washings from dredged material collected near Inchkeith, Firth of Forth, on July 4th, 1901. Though *Stenhelia ima* is apparently widely distributed, I have not found it to be very common.

Stenhelia intermedia, T. Scott.

1897. *Stenhelia intermedia*, T. Scott, 15th Ann. Rept. Fishery Board for Scotland, pt. iii., p. 169, pl. ii., figs. 10–21.

This somewhat rare species was dredged in Loch Etive in about 60 fathoms on September 17th, 1901.

Stenhelia hirsuta, I. C. Thompson.

1893. *Stenhelia hirsuta*, I. C. Thompson, Trans. L'pool Biol. Soc., vol. vii., p. 20, pl. xxi., fig. 2, d.e.f. (separate reprint).

Specimens of *Stenhelia hirsuta* were occasionally observed in gatherings of dredged material from the Firth of Forth collected in July, 1901.

(?) *Stenhelia hispida*, G. S. Brady. Pl. XXIV., figs. 19–26.

1880. *Stenhelia hispida*, Brady, Mon. Brit. Copep., vol. ii., p. 32, pl. xlii., figs. 1–14.

Description of the Female.—Length about 1 mm. ($\frac{1}{25}$ of an inch). The body is in general appearance somewhat similar to *Stenhelia ima* (fig. 19).

Antennules scarcely reaching to the end of the cephalo-thoracic segment, eight-jointed; the first four joints are large, but the last four are very small (fig. 20).

Antennæ short and moderately stout; secondary branches small and three-jointed (fig. 21).

Mandibles robust, with a broadly truncate biting edge which is armed with several small and somewhat irregular teeth; palp well developed, two-branched, but the posterior branch is very small (fig. 22).

Second maxillipeds stout, and armed with a moderately strong terminal claw (fig. 23).

First pair of thoracic feet stout; the proximal joint of the inner branches scarcely reach beyond the ends of the outer ones, second joint small, the third is about twice the length of the second, while the second and third together are scarcely equal to half the length of the first joint; the outer branches are composed of three sub-equal joints (fig. 24). The second, third, and fourth pairs are slender and moderately elongated, and the branches are all three-jointed; figure 25, which represents the fourth pair, shows that the inner branches are only slightly longer than the outer ones.

The fifth pair are foliaceous, the basal joints being broadly subtriangular, and furnished with five moderately stout but not very long setæ on the somewhat rounded apex. The secondary joints are subrotund, and scarcely reach beyond the apex of the basal joints; they are each provided with five setæ of unequal lengths, the second and third, counting from the inside, being considerably longer than the other three (fig. 26).

The caudal furca are very short.

Habitat.—This species was obtained in some dredged material from Station VII., Firth of Forth (between Fidra and the Bass Rock), on July 9th, 1901; it appears to be somewhat rare. No males were observed.

Remarks.—The *Stenhelia* just described, and which I have referred to *Stenhelia hispida*, G. S. Brady, while differing in a few particulars from the species named, agrees very well with it in several important particulars. The structure of the antennules, for example, is almost identical with that of the antennules in *Stenhelia hispida* as described and figured by Professor G. S. Brady, and the first and fifth pairs of feet are also nearly alike in both.

Stenhelia confusa, T. Scott (sp. n.). Pl. XXII., figs. 17–25.

Description of the Female.—Length about 9 mm. (about $\frac{1}{28}$ of an inch). Body moderately stout, tapering slightly towards the posterior end; rostrum prominent (fig. 17).

Antennules shorter than the cephalo-thoracic segment, moderately stout, and composed of eight joints; the first, second, and end joints are the longest, while the fifth and sixth are very small (fig. 18). The approximate proportional lengths of the various joints are shown in the formula—

Proportional lengths of the joints,	22	14	8	6	3	4	7	14
Numbers of the joints,	1	2	3	4	5	6	7	8

All the joints with the exception of the first are moderately setiferous.

The antennæ are somewhat similar to those of *Stenhelia ima*, Brady (fig. 19).

The mandibles are also somewhat similar to those of the same species, but the branches of the mandible-palp appear to be shorter (fig. 20).

The second maxillipeds resemble the same organs in *Stenhelia hispida*, G. S. Brady (fig. 21).

The first pair of thoracic feet are moderately stout, the inner branches are about one and a half times the length of the outer branches, first joint is equal to the entire length of the second and third, while the second is equal to about two-thirds the length of the end joint ; the joints of the outer branches are sub-equal (fig. 22).

The remaining three pairs of feet do not differ very materially from the same appendages of *Stenhelia ima*, except that they are scarcely so elongated (fig. 23).

The fifth pair is foliaceous, but comparatively short ; the secondary joints do not extend much beyond the produced inner portion of the basal joints, which in outline is broadly triangular, and furnished with three setæ of unequal length on the bluntly rounded apex, while two dagger-like spines spring from the inner margins ; the secondary joints are also somewhat triangular, but they are rather narrower than the produced inner portion of the basal joints ; the apex of the secondary joints, which is somewhat truncate, bears three small setæ, and three small hairs spring from the outer margin (fig. 24).

Caudal furca slender, and about as long as the last abdominal segment (fig. 25).

Habitat.—The species occurred very sparingly in some washings of dredged material from Station III., Firth of Forth (to the east of Inchkeith), collected on June 7th, 1901. No males were observed.

Remarks.—This species resembles *Stenhelia hirsuta*, I. C. Thompson, in some respects, and especially in the structure of the antennules, and in the length of the caudal furca ; but in that species the inner branches of the first pair of thoracic feet are long and slender, much more so than the present form. The two species differ also in the form of the fifth pair. And though the structure of the antennules of *Stenhelia confusa* bears a certain resemblance to those of *Stenhelia hirsuta*, it differs very distinctly in this as well as in some other respects from almost every other species of the genus.

Ameira tenuicornis, T. Scott (sp. n.). Pl. XXIV., figs. 1–9.

Description of the Female.—Length ·67 mm. (about $\frac{1}{37}$ of an inch). Body moderately slender and sub-cylindrical ; rostrum small (fig. 1).

Antennules slender and elongated, exceeding in length the cephalo-thoracic segment, and composed of eight joints ; the first and second joints are sub-equal ; the third and fourth are also sub-equal, but smaller than the preceding joints (fig. 2). The approximate proportional lengths of the various joints are shown by the formula. All the joints with the exception of the first one are sparingly setiferous.

Proportional lengths of the joints,	24	25	18	15	10	9	6	9
Number of the joints,	1	2	3	4	5	6	7	8

The antennæ are very slender, and the secondary branches are small and two-jointed, the end joint being the smallest (fig. 3).

The mandibles are of moderate size, narrow-cylindrical, and obliquely truncate at the apex, which is armed with a few minute spinules ; the basal portion of the mandible-palp is small but slightly dilated, and carries two branches ; the marginal branch is small and one-jointed and furnished with a few setæ ; the end joint is long and very slender, and is minutely serrated at the extremity (fig. 4).

The second maxillipeds (posterior foot-jaws) are moderately stout and armed with strong terminal claws (fig. 5).

The first pair of thoracic feet are elongated and slender, and especially the inner branches, the first joint being about as long as the entire length of the outer branches; the other joints are small, but the end one is about twice the length of the penultimate joint (fig. 6). The following three pairs have the outer branches long and slender; the inner branches are also slender, but they are shorter than the outer, as shown by the figure (fig. 7) which represents one of the fourth pair.

The fifth pair are small and somewhat foliaceous, the basal joints are sub-triangular and provided with about four setæ on the rounded apex. The secondary joints are subovate, and the inner margins are fringed with minute hairs, while one or two moderately long setæ spring from the apex, and one or two others from the outer margin (fig. 8).

Caudal furca shorter than the last abdominal segment (fig. 9).

Habitat.—Dredged at Station VI., Firth of Forth (off St. Monans), in July 1901; only one or two specimens were obtained, but no males were observed.

Remarks.—This species is readily distinguished by the elongated antennules and the long and slender first pair of feet; it differs in both of these appendages from *Ameira longipes*, Boeck, as well as from the other described species of *Ameira* known to me.

Ameira propinqua, T. Scott (n. sp.). Pl. XXIV., figs. 10–18.

Description of the Female.—Length about ·6mm. (nearly $\frac{1}{40}$ of an inch). Body slender, sub-cylindrical, the cephalo-thoracic segment about equal to the entire length of the next three segments, rostrum very small (fig. 10).

Antennules slender and rather longer than the cephalo-thoracic segment, eight-jointed; the second joint is the longest, the first and third are sub-equal and about two-thirds the length of the second; the remaining joints are small (fig. 11). The formula shows approximately the proportional lengths of the various joints:—

Proportional lengths of the joints,	12 · 17 · 12 · 4 · 4 · 5 · 3 · 5
Numbers of the joints,	1 · 2 · 3 · 4 · 5 · 6 · 7 · 8

Antennæ elongate and moderately stout, secondary branches small, slender, and one-jointed (fig. 12).

Mandibles cylindrical and not very broad, the truncate apex is armed with a stout spine on the outer angle and a few small spiniform setæ, as shown by the drawing (fig. 13). The mandible-palp is of moderate size, the basal joint is provided with a single one-jointed and terminal branch.

The second maxillipeds (posterior foot-jaws) are small but with well-developed terminal claws, which are rather longer than the joints to which they are articulated (fig. 14).

The first four pairs of thoracic feet are slender and elongated. In the first pair the inner branches are narrow and considerably longer than the outer branches, the length of the first joint is equal to that of the second and third combined, but the second and third joints are sub-equal in length; a single small seta springs from the inner margins of the first and second joints, while the end joints are provided with three terminal hairs, the middle one being the longest. The outer branches, which are composed of three sub-equal joints, reach to a little beyond the end of the first joint of the inner branches (fig. 15). The inner branches of the next three pairs are considerably shorter than the outer branches, which are slender and elongated (fig. 16). In all the four pairs the outer and inner branches are three-jointed.

In the fifth pair the basal joints are broadly foliaceous and sub-triangular in outline, with the apex truncate and provided with four spiniform setæ, the outermost of which is very small; the secondary joints are long, narrow, and cylindrical, being about four times longer than broad, the extremity, which is obliquely truncate, carries several setæ, the two inner ones being longer than the others (fig. 17).

The caudal furca are shorter than the last abdominal segment; the furcal setæ are elongated (fig. 19).

Habitat.—Station VI. (off St. Monans), Firth of Forth, dredged on July 8th, 1901. The species is apparently very rare. (For drawings of what may be the male of this species, *see* Pl. XXII., figs. 36–42, and Pl. XXIII., fig. 1.)

Remarks.—In some respects *Ameira propinqua* comes rather near to *Ameira longiremis*, T. Scott, the fifth feet especially being very similar to those of that species, as well as to those of *Ameira longipes*, Boeck, but the structure of the antennules and of the first pair of feet separate it distinctly from both the species named.

Pseudotachidius coronatus, T. Scott

1898. *Pseudotachidius coronatus*, T. Scott, 16th Ann. Rept. Fishery Board for Scot., pt. iii., p. 267, pl. xiii., figs. 12–26; pl. xv., figs. 1–4.

This distinct species has been obtained in a gathering of small crustacea dredged in Loch Etive in 55 to 65 fathoms on September 17th, 1901. *Pseudotachidius coronatus* has not previously been recorded out of the Clyde district.

Pterinopsyllus insignis, G. S. Brady.

1868. *Lophophorus insignis*, G. S. Brady, Mon. Brit. Copep., vol. i., p. 122, pl. xiii., figs. 1–10. (See also *op. cit.*, vol. iii., p. 23, where the generic name is changed to *Pterinopsyllus*, —"*Lophophorus*" being preoccupied.)

This fine species was obtained in the same gathering as the *Pseudotachidius* just recorded, and appears to be the first record of it from the West of Scotland. It has in previous years been obtained in the Firth of Forth and the Moray Firth. Although *Pterinopsyllus insignis* and *Pseudotachidius coronatus* have a general resemblance to one another they may be readily distinguished by the difference in the lengths of the antennules—those of the first-named species being distinctly longer and more slender than in the other.

Mesochra macintoshi, T. and A. Scott.

1895. *Mesochra macintoshi*, T. and A. Scott, Ann. and Mag. Nat. Hist., (6), vol. xv., p. 53, pl. vi., figs. 1–7.

Mesochra macintoshi, which was first observed amongst a number of peculiarly slender copepods collected on the south shore of the Firth of Forth near Musselburgh, has lately been obtained at Station VI. (off St. Monans). It is apparently a rare species, but being one of those forms which live upon the bottom it may from its small size be easily overlooked.

Pseudomesochra, T. Scott (gen. nov).

This genus is somewhat intermediate between *Mesochra*, Boeck, and *Cletodes*, G. S. Brady. The antennules (anterior antennæ) are composed

of six joints. The secondary branches of the antennæ (posterior antennæ) are small and two-jointed. Mandibles stout, mandible-palp well developed and provided with two branches, Other mouth organs similar to those in *Mesochra* and *Cletodes*. The first four pairs of thoracic feet have the outer branches three- and the inner branches all two-jointed. Fifth somewhat rudimentary and composed of a single lamelliform joint. Ovisacs apparently double.

Pseudomesochra differs from *Mesochra*, *Cletodes*, and allied genera chiefly in the structure of the mandible-palp and fifth pair of feet.

Pseudomesochra longifurcata, T. Scott (sp. nov.) Pl. XXIV., figs. 27–35.

Description of the Female.—Length about ·5mm. ($\frac{1}{50}$ of an inch). Body moderately stout, tapering slightly towards the posterior end; abdomen not distinct from thorax; rostrum small; caudal furca elongated, being nearly equal to the entire length of the last three abdominal segments (fig. 27).

Antennules short, moderately stout, and composed of six joints, the first two and the last being each considerably longer than any of the other three (fig. 28). The approximate proportional lengths of the various joints are shown by the formula:—

Proportional lengths of the joints, -	23 · 20 · 8 · 5 · 4 · 15
Numbers of the joints, - - -	1 · 2 · 3 · 4 · 5 · 6

The antennæ are of moderate size; secondary branches two-jointed and provided with several marginal and terminal setæ (fig. 24).

Mandibles robust and having the biting end armed with several stout teeth; mandible-palp well developed and the basal part furnished with two branches (fig. 30).

Second maxillipeds short and moderately stout, but the terminal claw is rather feeble, and fringed with a few minute hairs (fig. 31).

The first four pairs of thoracic feet slender. In the first pair both branches are about the same length; the joints of the inner branches are sub-equal, and a single seta springs from the inner margin and three from the end of the second joint, the proximal joint appears to be unprovided with setæ or spines (fig. 32). In the second, third, and fourth pairs the inner branches in each are rather shorter than the outer branches, and the end joints somewhat longer than the proximal ones, and in these three pairs of feet the inner branches are more setiferous than the inner branches of the first pair (fig. 33). The fifth pair, which are small and somewhat rudimentary, appear to be composed of a single lamelliform joint, bearing three long apical setæ (fig. 34).

Habitat.—Upper Loch Etive, where it was dredged by the "Garland" in over 60 fathoms on September 17th, 1901. It appears to be a rare species, as only a single specimen (a female) was observed, but as the species is a very small one it may be easily overlooked.

Leptopontia, T. Scott (gen. nov.).

Body slender and cylindrical. Antennules (anterior antennæ) seven-jointed, slender. The secondary branches of the antennæ are entirely wanting or reduced to a single seta. Mandibles slender and moderately elongate; mandible-palp also slender and one-branched. Other mouth organs somewhat as in *Mesochra*, Boeck. The first four pairs of thoracic feet slender, outer branches three- and inner branches all two-jointed. The inner branches of the first pair elongated—the end joint being the shortest, the outer branches short, the inner branches of the other three pairs very short, and the outer elongated. Fifth pair small, foliaceous, two-branched; secondary branches (or joints) minute.

Leptopontia curvicauda, T. Scott (sp. n.). Pl. XXII., figs. 26–35.

Description of the Female.—Length ·6mm. (about $\frac{1}{42}$ of an inch). Body slender, cylindrical; cephalo-thoracic segment moderately short, scarcely three times the length of the next one; rostrum short (fig. 26).

The antennules are slender and longer than the cephalo-thoracic segment, seven-jointed, the first joint is longer than any of the others, the second and third are sub-equal, the fourth, fifth, and sixth joints are each about half the length of the third, while the end joint is about twice the length of the one next to it (fig. 27). The formula shows approximately the proportional lengths of the different joints:—

Proportional lengths of the joints, -	28 · 18 · 17 · 8 · 7 · 7 · 14
Numbers of the joints, - - -	1 · 2 · 3 · 4 · 5 · 6 · 7

Antennæ slender, consisting of two elongated joints; the secondary branches are represented by a single minute hair (fig. 28).

Mandibles slender and elongated, the biting end is obliquely truncated and armed with a number of small teeth; the mandible-palp is also elongated, and one branched, the basal joint is moderately stout, and about twice the length of the single-jointed branch, and is furnished with a few small setæ (fig. 29).

The posterior foot-jaws (fig. 30) are not unlike those of *Tetragoniceps incertus*, T. Scott. The inner branches of the first pair of thoracic feet are slender, elongated, and two-jointed, the end joint being only about one-third the length of the other; the outer branches, which are three-jointed, are scarcely half the length of the inner branches (fig. 31). In the second, third, and fourth pairs the outer branches are long and slender, and three-jointed; the joints of the outer branches of the second pair are sub-equal in length, but in the outer branches of the third and fourth pairs the first and second joints are sub-equal and rather longer than the end joints. The inner branches of the same three pairs are short and two-jointed; in the second pair the inner branches are rather longer than the first joint of the outer branches; but in the third and fourth pairs the inner branches are shorter than the first joint of the outer branches, as shown by the drawing (figs. 32, 33).

In the fifth pair the basal joints are moderately large and foliaceous, the inner produced part is broadly rounded, and bears three apical setæ, and the secondary joints, which are very small, also carry three setæ (fig. 34).

The last abdominal segment is armed on the median dorsal aspect with a backward-pointing tooth as shown in figures 26 and 35.

The caudal furca, which are nearly as long as the last abdominal segment, become gradually attenuated towards the distal extremity; and in all the specimens that have been obtained the furca are distinctly recurved as shown in the habitus drawing (fig. 1).

Habitat.—Dredged in the Firth of Forth at Station VI. (off St. Monans) on July 8th, 1901; not very common.

Remarks.—Odd specimens of this species have been observed from time to time for a considerable while past, but the first specimens were put aside as being probably immature forms of some species already described. I am now, however, convinced that they are distinct *Leptopontia* in some respects resembles both *Mesochra*, Boeck, and *Tetragoniceps*, G. S. Brady, in its structural details, but in the absence of a secondary branch to the antennæ, in the elongate and slender form of

the mandibles, and the one-branched mandible-palp, it does not agree very well with either of the genera named, which are its nearest allies.

Laophonte similis (Claus).

This species was obtained in the same material with the last, collected off St. Monans; and it was also taken from the swimmerets of a Spider Crab (*Hyas arenarius*) from the Bay of Nigg on May 23rd, 1901.

Laophonte curticauda, Boeck.

Specimens of this species were obtained on several occasions on the swimmerets of the common Shore Crab (*Carcinus mœnas*), but whether its occurrence on the swimmerets of the Crab was accidental or whether the copepod is associated with the Crab as a commensal, is a question that will require further research to determine. It may be mentioned, however, the *Laophonte* was obtained as described on almost ever Crab examined.

Normanella attenuata, A. Scott. Pl. XXIII., figs. 2–4.

1896. *Normanella attenuata*, A. Scott, Rept. for 1895, on Lancashire Sea-Fisheries Laboratory, p. 47, pl. iv., figs. 8–20.

This species, which was first discovered in a gathering collected one mile off Spanish Head, Isle of Man, from a depth of 16 fathoms, is now added to the fauna of the Firth of Forth; it was obtained in dredged material from Station VI. (off St. Monans), at a depth of about 10 fathoms. *Normanella attenuata* is a slender species, measuring about a millimetre in length. The rostrum is very small; the antennules are slender, somewhat elongated, and nine-jointed, The outer branches of the first four pairs of thoracic feet are all three-jointed, but the inner branches of the first three pairs are two-jointed, while in the fourth pair the inner branches, like the outer ones, are three-jointed. The inner branches of the first pair, which are considerably longer than the outer ones, have the end joints short (fig. 3), and armed at the apex with an elongate spine, and two setæ of unequal length. The inner branches of the second, third, and fourth pairs are shorter than the elongate outer branches.

The fifth pair are broadly foliaceous and of moderate size, as shown by the drawing (fig. 4).

In the female the first segment of the abdomen is larger than those which follow, being composed of two coalescent joints, as shown by the habitus figure (fig. 2).

In this species the thoracic portion of the body is rather shorter than the abdomen, and gives to the animal a more than usually slender appearance.

Though, from its occurrence in the Forth, *Normanella attenuta* would appear to have a moderately extensive distribution, it does not seem to be very common. This species differs from *Normanella dubia*, Brady and Robertson, in its general conformation, by its elongated antennules, and by the form of the fifth pair of thoracic feet; but it differs more particularly in that the inner branches of the fourth pair are three-jointed. In this respect it disagrees with the generic definition of *Normanella*, and may for this, and perhaps one or two other reasons, require to be removed to another genus.

Cletodes longicaudata, Brady and Robertson. Pl. XXIII., figs. 26–33.

1875. *Cletodes longicaudata*, Brady and Robertson, Brit. Assoc. Rept., p. 196.

1880. *Cletodes longicaudata*, Brady, Mon. Brit. Copep., vol. iii., p. 92, pl. lxxix., figs. 13–19.

A perfect specimen—a female with ova—was obtained in a gathering from the west end of Station III., Firth of Forth, collected on June 7th, 1901. As the species is somewhat rare I give a short description of it, along with figures of some of the principal appendages. The female specimen referred to measured about ·84 mm. ($\frac{1}{30}$ of an inch) in length from the forehead to the end of the caudal furca, but the caudal furca, which are very long, are about equal to a fourth of the entire length of the animal; the rostrum is of moderate length (fig. 26).

The antennules are short, moderately stout, and composed of five joints. Professor G. S. Brady describes the antennules of his specimen as six-jointed, but this difference may be due to a slight local variation. The fourth joint is very small and carries an asthetask or sensory filament (fig. 27). The formula shows approximately the proportional lengths of all the joints :—

Proportional lengths of the joints,	6 ·	13 ·	20 ·	4 ·	23
Numbers of the joints,	1 ·	2 ·	3 ·	4 ·	5

The antennæ (fig. 28) are of moderate size, but the secondary branches are small and one-jointed.

In the first four pairs of thoracic feet, the outer branches, which are all three-jointed, are all of them somewhat similar in structure; the first joint is slightly longer than the second, while the end joint is distinctly longer than either of the other two; the marginal armature consists also of setæ rather than spines. The inner branches of all the four pairs are slender and two-jointed, the first joints being very short. In the first pair the end joints of the inner branches extend somewhat beyond the outer branches and are furnished with two long terminal setæ (fig. 29). In the second pair the end joints of the inner branches are, like those of the first pair, long and slender, but they do not reach to the extremity of the outer branches; they bear two long terminal setæ (fig. 30). In the third and fourth pairs, the inner branches are considerably shorter than the outer and bear one sub-terminal and two apical setæ (fig. 31).

The fifth pair are moderately large; the secondary branches are elongated, narrow-cylindrical, and about four times longer than broad; they are armed with two terminal and three strong marginal setæ, as shown in the figure; the inner produced portion of the basal joint is nearly as long as the secondary joint, and provided with three moderately elongated setæ near the distal end; a long slender seta also springs from the outer aspect of the basal as shown (fig. 32).

Cletodes longicaudata does not appear to be a very common species anywhere, although it seems to be widely distributed.

Fultonia, T. Scott (gen. nov.).

This genus is somewhat like *Cletodes*, G. S. Brady, in general appearance. The abdomen in not distinctiy separated from the thorax. The antennules are moderately short and composed of about eight joints. The antennæ are each furnished with a small secondary branch. The mouth organs are similar to the same appendages in *Cletodes*. The outer branches of the first four pairs of thoracic feet are all three-jointed, while the inner branches of the first pair are composed of two, and of the second, third, and fourth pairs of three joints. The fifth pair are nearly

as in *Cletodes*. The copepods for which I have instituted this genus do not correspond to any described form known to me. The genus is named in compliment to Dr. T. Wemyss Fulton, Superintendent of the Scientific Work of the Fishery Board for Scotland.

Fultonia hirsuta, T. Scott (sp. nov.). Pl. XXIII., figs. 5–12.

Description of the Female.—Length about ·63 mm. ($\frac{1}{40}$ of an inch). Body somewhat slender and sub-cylindrical, the posterior margins of abdominal segments fringed with short projecting hairs, which give to this part of the animal a peculiarly hirsute appearance, caudal furca short, rostrum small (fig. 5).

Antennules rather slender, and shorter than the cephalo-thoracic segment, eight-jointed; the first three joints are moderately large, but the others are short; all the joints, with the exception of the first, are more or less setiferous; an elongated and slender asthetask springs from the upper distal angle of the fourth joint (fig. 6). The approximate proportional lengths of all the joints are shown by the formula—

Proportional lengths of the joints,	10	14	11	6	5	7	6	6
Numbers of the joints	1	2	3	4	5	6	7	8

The antennæ are similar to those of *Cletodes*; the secondary branches are very small, and one-jointed, and furnished with a single terminal hair (fig. 7).

Mouth organs somewhat similar to those of *Cletodes*; the second maxillipeds, which are moderately elongated, are provided with long slender terminal claws (fig. 8).

The thoracic feet are all moderately slender; the outer branches of the first four pairs and the inner branches of the second, third, and fourth pairs are all three-jointed, while the inner branches of the first pair are only two-jointed. All the inner branches are short; those of the first pair are just about half the length of the outer branches and carry three small terminal setæ or spines (fig. 9). The inner branches of the other three pairs are scarcely more than a third of the length of the outer branches (fig. 10). The outer branches of the same three pairs are rather more elongated than those of the first pair.

In the fifth pair the basal consists of a narrow plate articulated to the last thoracic segment, and bearing one or two small marginal setæ; the exterior extremity of the basal joint is produced into a very narrow lobe which forms the base of a small seta. The secondary joints are narrow and sub-cylindrical, and about four times longer than broad, and furnished with about half-a-dozen small marginal and terminal setæ (fig. 11).

Habitat.—Station VI., Firth of Forth (off St. Monans), dredged in 13 to 15 fathoms, on May 22nd, 1901.

Remarks.—This species somewhat resembles *Cletodes irrasa*, T. Scott, in its hirsute appearance, but in that species the antennules are six-jointed, the inner branches of all the first four pairs of thoracic feet are only two-jointed, while the caudal furca are moderately long and slender. The species does not resemble any described form known to me.

Nannopus palustris, G. S. Brady. Pl. XXIII., figs. 13–25.

1880. *Nannopus palustris*, Brady, Mon. Brit. Copep., vol. ii., p. 101, pl. lxxvii., figs. 18–20.

This curious and rather interesting copepod, which Professor G. S. Brady discovered living in brackish water pools in a salt march at Seaton Sluice, Northumberland, and which has subsequently been found in

similar situations in various parts of the British Islands as well as on the Continent, was during the preceding summer (1901) obtained near Newburgh on the Ythan, Aberdeenshire. Both the males and females of *Nannopus palustris* were obtained in the brackish water pools at this Aberdeenshire Station, and as no description or drawing of the male has yet, so far as I know, been published, the following notes on both of the sexes may be of interest.

The body of the female seen from the dorsal aspect is moderately stout anteriorly, but tapers gradually and evenly towards the posterior end (fig. 13); the female specimen represented by the drawing measures about ·9 mm. ($\frac{1}{28}$ of an inch) in length.

The antennules, which are short and stout, are composed of five joints, the penultimate joint being very small; the last four joints are densely setiferous, but the sensory filament (asthetask) which springs from the end of the third joint is comparatively short and slender (fig. 15).

The antennæ are very small, though comparatively moderately stout; the secondary branch is small and one-jointed and provided with a few apical setæ (fig. 16).

The mandibles are moderately stout, their biting end is somewhat truncate and provided with a few stout teeth; the mandible-palp consists of a one-jointed and somewhat dilated appendage articulated near the base of the mandible and provided with a few short setæ (fig. 17).

The second maxillipeds are small, the terminal claws are moderately stout and carry a few minute hairs on their inner margins (fig. 18).

In the first four pairs of thoracic feet the outer branches, which are moderately stout, are all three-jointed and armed with elongate though somewhat slender spines on their outer margins; the inner branches of the first, second, and third pairs are considerably shorter than the outer, and each composed of two joints, but the inner branches of the first pair are rather smaller than those of the second and third (fig. 19). The inner branches of the fourth pair are rudimentary and consist of a single minute joint which carries a very small and a moderately elongated seta (fig. 20).

The fifth pair resemble somewhat closely the fifth pair in *Enhydrosoma curvatum*, Brady and Robertson, the basal joint is very broad and short, they form short lamelliform plates along the postero-ventral margin of the last thoracic segment, four moderately stout plumose setæ spring from the edge of the inner half of each basal joint; the secondary joints are small and sub-rotund, and each furnished with five moderately long setæ round the distal margin (fig. 21).

The caudal furca are very short.

Description of the Male.—The male differs little from the female except in the following points; it is, when seen from above, distinctly narrower than the female, especially towards the anterior end (fig. 14). The antennules are shorter and less prominent, the basal joints are also more dilated, but the antennules taper quickly towards the distal end, the penultimate joint is considerably swollen and assumes a utricule-like form, while the end joint is very small (fig. 23).

The mouth organs in the male appear to be very similar to those of the female. The thoracic feet are also similar in both sexes, except that the inner branches of the third pair are provided with a short but stout terminal spine slightly hooked at the end, and a single plumose seta instead of a moderately long slender spine and two plumose setæ as in the third pair in the female (fig. 24). The fifth pair in the male resemble those of the female, except that the secondary joint appears to be almost obsolete

(fig. 25); the appendages to the first abdominal segment in the male are small and carry three setæ—two moderately long and one short.

Dr. Eugene Canu has given a very full series of figures of the female, but he refers to the male as being unknown.*

Dactylopus coronatus, T. Scott.

1894. *Dactylopus coronatus*, T. Scott, 12th Ann. Rept. of the Fishery Board for Scot., pt. iii., p. 255, pl. ix., figs. 12–20.

This species was dredged off the North Craig, Inchkeith, Firth of Forth, in 8 fathoms, on July 4th, 1901. The first specimens from which the species were described were also obtained in the Firth of Forth, but in the vicinity of the Bass Rock, near the mouth of the estuary. The Firth of Forth appears to be the only Scottish locality where this *Dactylopus* has been hitherto obtained.

Cylindropsyllus lævis, G. S. Brady.

1880. *Cylindropsyllus lævis*, G. S. Brady, Mon. Brit. Copep., vol. iii., p. 30, pl. lxxxiv., figs. 1–8.

A male specimen of this large and somewhat remarkable species was obtained in some bottom material from Smith Bank, Moray Firth, on February 15th, 1901.

Monstrillidæ.

The Family Monstrillidæ is represented in the copepod fauna of our seas from the English Channel to the Shetland Islands; a few of the species appear to be somewhat local in their distribution, while others are co-extensive with the seas that surround our shores. The family comprises the two genera *Monstrilla*, Dana, and *Thaumaleus*, Kröyer, and both are represented in the marine fauna of Scotland. Specimens belonging to this curious group of copepods have been captured at odd times in the Firth of Forth almost every year since 1888.† The first specimens obtained were ascribed to *Cymbasoma rigida*, I. C. Thompson, but they were shortly afterwards submitted to Mr. Gilbert C. Bourne, who was preparing a revision of the various forms which had recently been observed in the British seas, and his opinion of these specimens from the Forth estuary was that they were identical with *Monstrilla helgolandica*, Claus.‡ Other specimens have been obtained at odd times which appeared to belong to the same species, and also one or two belonging to a different species, and which were subsequently identified as the true *Monstrilla rigida* of I. C. Thompson. Two apparently adult specimens of a *Monstrilla* were obtained in some tow-net gatherings collected by the "Garland" on the 24th of July, 1901, and as they seem to differ from those previously mentioned as occurring in the Forth estuary, I give here a short description of them—they appear to be identical with the form described by Dr. Giesbrecht under the name of *Monstrilla longiremis*.

Specimens of *Monstrilla* have also in recent years been obtained in the Firth of Clyde, and though usually they have occurred very sparingly, yet on one or two occasions large numbers have been obtained in a single tow-net gathering. In a small gathering of material, in which there was

* Les Copép. du Boulonnais, p. 166, pl. iv., fig. 6–21 (1892).

† Annual Report of the Fishery Board for Scotland, Part III., p. 316 (1889).

‡ Notes on the genus *Monstrilla*, Dana; Quart. Journ. Micr. Sci., (2), vol. 30, p. 515 pl. xxxvii., figs. 14, 15 (1890).

a good deal of fibrous matter, collected in Loch Fyne on September 29th, 1899, over eighty specimens of *Monstrilla* were obtained, while in another, collected on the 28th of November, twenty-seven specimens were found.* All these specimens, which appear to belong to the one species, I have recorded as *Monstrilla* (?) *danæ*, Claparède.† It may be remarked, however, that Dr. Giesbrecht seems to think that the species described by Claparéde is not a *Monstrilla*, but should be placed in the genus *Thaumaleus*.‡

In a tow-net gathering collected in Lerwick Harbour in October last year (1900), a specimen belonging to the group of copepods under consideration was obtained, but owing to some doubt concerning its identification it was left over for further examination. I now find that this specimen belongs to the genus *Thaumaleus* of Kröyer, and a short description of it follows that of *Monstrilla*.

But besides the specimens alluded to above, others have been obtained in the Moray Firth, which have still to be examined; but the study of the group is a somewhat difficult one, and the more so as some of the descriptions and figures of the earlier writers are sometimes wanting in that fulness necessary for certain identification.

Monstrilla longiremis, Giesb. Pl. XXV., figs. 3, 4.

1892. *Monstrilla longiremis*, Giesbrecht, Pelagischen Copepoden des Golfes von Neapel, p. 589, pl. 46, figs. 10, 14, 22, 37, 41.

The *Monstrilla* which I now record from the Firth of Forth was obtained in a bottom tow-net gathering collected at Station V. (to the west of May Island) on July 24th, 1901. The antennules (first antennæ) are moderately elongated, but with the exception of an articulation near the base, the joints are very indistinct; the setæ were imperfect, and did not show the branched structure exhibited in Dr. Giesbrecht's figure of the antennule of *Monstrilla longiremis*. In the general form of the body and of the thoracic appendages the Forth specimen agrees very well with the species named. The abdomen consists of four segments, but the articulation between the first and second is not very marked, the third and fourth are short and distinct. The furca are of moderate size, and are each provided with five setæ as shown in the figure; no trace of a sixth seta could be observed.

The fifth feet consist each of a short, one-jointed sub-cylindrical branch, the proximal half of which is somewhat delated interiorly; each branch is furnished with three apical setæ, the inner one being much shorter than the other two, and a fourth seta springs from the inner margin as shown in the figure.

From these descriptive notes on this specimen from the Firth of Forth there seems to be little doubt that it is identical with the species described by Dr. Giesbrecht under the name of *Monstrilla longiremis*. The Forth specimen certainly does not show the branching setæ exhibited in Dr. Giesbrecht's figure; but this is not very surprising when it is remembered how delicate these long branching setæ are, and the friction they may be subjected to while in the tow-net. The specimen I have described is a female; no male was observed.

* Eighteenth Annual Report of the Fishery Board for Scotland, Part III., pp. 398–99, pl. xiii., figs. 15–20 (1890).

† This species has also recently been observed in a gathering from the Firth of Forth collected at Station V. in 1901.

‡ Pelagischen Copepoden des Golfes von Neapel, p. 578 *et seq.*

Dr. Giesbrecht, in his great work on the Pelagic Copepoda of the Gulf of Naples, seems to be in doubt as to whether the Forth specimens considered by Mr. Bourne as belonging to the *Monstrilla helgolandica*, Claus, can really be identical with that species, and is rather inclined to ascribe them to his *M. longiremis*; the chief difficulty in the way of accepting this conclusion, however, is that Bourne, in describing the specimens, states that they possessed six furcal setæ, whereas in *M. longiremis* there are only five; unfortunately the mounted preparations from which the original description and figures were prepared were accidentally destroyed, and I am therefore unable to throw any light on the subject; but the occurrence of the specimen of *Monstrilla longiremis* just recorded seems to lend some support to the doubt expressed by Dr. Giesbrecht. Moreover it is interesting to note that none of the species mentioned by Mr. Bourne appear to have been provided with five furcal setæ, the number observed being either three or six.

Thaumaleus thompsoni, Giesb. Pl. XXV., figs. 5, 6.

1892. *Thaumaleus thompsoni*, Pelagischen Copepoden des Golfes von Neapel, p. 584, pl. 46, figs. 7, 27, 31, 36, 40.

A male specimen of a Copepod, which is apparently identical with *Thaumaleus thompsoni*, Giesbrecht, was obtained in a tow-net gathering collected in Lerwick Harbour, Shetland, on October 15th, 1901. In the male of this species the first of the two abdominal somites is shorter than the second, while in the female the first abdominal segment is, according to Dr. Giesbrecht, distinctly more dilated than the other. The caudal furca in the male are each provided with three setæ (fig. 5), but the female, according to Giesbrecht, has four.

One of the more obvious differences between the genus *Thaumaleus* and *Monstrilla* is that in the first the abdomen is composed of not more than two segments, exclusive of the caudal furca, whereas in *Monstrilla* the abdomen is composed of three, and sometimes of four, segments. Moreover, in *Thaumaleus* the number of hairs on the caudal furca is usually three or four, while *Monstrilla*, on the other hand, is provided with five or six furcal setæ.

Lichomolgidæ.

Lichomolgus furcillatus, Thorell.

This species was obtained in the washings of some dredged material collected at the north end of Inchkeith on May 23rd, 1901.

Lichomolgus hirsutipes, T. Scott.

1893. *Lichomolgus hirsutipes*, T. Scott, 11th Ann. Rept. of the Fishery Board for Scotland, pt. iii., p. 206, pl. iv., figs. 1–12.

This was dredged off the North Craig, Firth of Forth, on July 4th, 1901; the species was described from specimens collected in the vicinity of the Bass Rock at the mouth of the estuary in 1893; it appears to be a rare species.

Pseudanthessius liber (Brady and Robertson).

1875. *Lichomolgus liber*, B. and R., Brit. Assoc. Report, p. 197.

This species was obtained in the same gathering with the last. It appears to be a more common and more widely distributed species than *Lichomolgus hirsutipes*.

Pseudopsyllus, T. Scott (gen. nov.).

Somewhat like *Clausia*, Claparède, in general appearance; the abdomen scarcely distinct from the thorax; antennules composed of six short but stout joints. The antennæ are somewhat similar to those of *Hersiliodes*, Canu. Second maxillipeds apparently two-jointed, and armed with extremely long and powerful terminal claws; other mouth organs unknown. The first four pairs of thoracic feet have both branches three-jointed as in *Hersiliodes*. Fifth pair short, and composed of a single lamelliform joint. Male unknown.

Pseudopsyllus elongatus, T. Scott (sp. nov.). Pl. XXIV., figs. 36–42.

Description of the Female.—Length 1·4 mm. ($\frac{1}{18}$ of an inch). Body elongate-narrow; when viewed from above the anterior thoracic portion is slightly broader than the abdomen, but the distinction between thorax and abdomen is not very marked (fig. 36). The cephalo-thoracic segment is about equal to the entire length of the next four; rostrum short.

Antennules very short and stout and composed of six sub-equal joints; moderately setiferous and provided with three sensory filaments—one on the fourth joint, one on the fifth, and one on the end of the last joint (fig. 37). The formula shows approximately the lengths of the different joints:—

Proportional lengths of the joints,	15 · 11 · 9 · 12 · 10 · 13	
Numbers of the joints,	1 · 2 · 3 · 4 · 5 · 6	

. The antennæ are small but moderately stout, the first joint is the largest, the second and third are small, while the fourth is nearly as long as the second and third combined; the exterior angle of the joint extends forward to near the middle of the end joint and terminates in a small spine; the end joint seems, for the reason just stated, to arise from slightly beneath the penultimate one, somewhat similar to the structure of the same appendages in species of *Hersiliodes* (fig. 38).

The second maxillipeds—the only mouth organs obtained—are robust and armed with long and powerful terminal claws (fig. 39).

The first four pairs of thoracic feet are stout, moderately elongated, and with both branches three-jointed and of nearly equal length. In the outer branches of the first pair (fig. 40) a stout and moderately long spine springs from the outer distal angle of the first and second joints, while the end joint carries three similar spines on the outer margin and apex; a plumose seta springs from the inner margin of the second joint, and five from the inner margin and apex of the last joint; the first and second joints of the inner branches are each provided with one plumose seta on the inner margin, while the end joint carries two marginal and two apical setæ, in addition an elongate spine which springs from its outer distal angle. In the fourth pair the armature of the first and second joints of the outer branches is similar to that of the first and second joints of the outer branches of the first pair except that the marginal spines are not so elongated; but the armature of the end joint differs from that of the same end joint of the first pair in that it carries only one small spine on the distal half of the outer margin and a moderately long but slender sub-apical spine, while round the inner margin and apex there are six instead of five plumose setæ; the armature of the inner branches differs from that of the inner branches of the first pair, the second joint is provided with two setæ on its inner margin instead of one, while the end joint bears only three apical setæ, instead of four setæ and an elongate spine as in the first pair (fig. 41).

The fifth pair consist each of a single one-jointed lamelliform branch, sub-cylindrical in outline and fully twice as long as broad; they are each furnished with a single seta on the outer margin, while two setæ and a small spine spring from the truncated apex—the spine being articulated at the inner angle; a seta also springs from the exterior angle of the last thoracic segment, to which the fifth foot is articulated (fig. 42).

The caudal furca are moderately broad and nearly as long as the last abdominal segment (fig. 36).

Habitat.—Dredged at Station VII., Firth of Forth (between Fidra and the Bass Rock), on July 9th, 1901. Only a single female specimen was observed.

Remarks.—The specimen described above has such a close general resemblance to *Clausia cluthae*, T. and A. Scott,* that it was at first considered to belong to the same genus, but when closely examined it is found to differ in several important points, *i.e.* the structure of the antennæ and the form and armature of the second maxillipeds. The inner branches of the first four pairs of thoracic feet are all three-jointed, and thus differ very distinctly from those of *Clausia*.

I do not know of any genus or species to which this copepod could be ascribed.

ASTEROCHERIDÆ.

Asterocheres violaceus (Claus).

This somewhat rare species was obtained in a bottom gathering collected about 60 miles to the east of Shetland (or 180 miles north-east of Buchan-ness), on May 22nd, 1901. This species has been taken by my son, Mr. Andrew Scott, in the Irish Sea,† and it has also been obtained in the Firth of Clyde.‡

Rhynchomyzon purpurocinctum (T. Scott).

This distinct and widely distributed species was observed in some material dredged at the north end of Inchkeith on May 23rd, 1901. The specimens from which the species was described were also obtained in the Firch of Forth, but nearer the mouth of the estuary. *Rhynchomyzon purpurocinctum*, though widely distributed, is not very common, and occurs only very sparingly.

Acontiophorus ornatus (Brady and Robertson).

1875. *Ascomyzon ornatum*, Brady and Robertson, Brit. Assoc. Rept., 1875, p. 197.
1880. *Acontiophorus armatus*, G. S. Brady, Mon. Brit. Copep., vol. iii., p. 71, pl. lxxxvii., figs. 8–15.

A few specimens of this fine species were obtained in the washings of some dredged material collected near North Craig, Firth of Forth, on July 4th, 1901. This is the first time *Acontiophorus ornatus* has been observed in the Firth of Forth. It is a moderately large species, being not only robust in form bnt reaching a length of about one and a half millimetres.

* Ann. and Mag. Nat. Hist., (6), vol. xviii., p. 1, pl. 1, figs. 1–12.

† Report for 1895 on the Lancashire Sea-Fisheries Laboratory, p. 54, pl. v., figs. 16–26 described under the name of *Ascomyzon thompsoni*), pub. 1896.

‡ Sixteenth Annual Report of the Fishery Board for Scotland. Part III., p. 270 (1898).

Cribropontius Normani (Brady and Robertson).

1875. *Dyspontius Normani*, Brady and Robertson, Brit. Assoc. Report (1875), p. 197.
1880. *Artotrogus Normani*, G. S. Brady, Mon. Brit. Copep., vol. iii., p. 63, pl. xci., figs. 12–15; pl. xcii., fig. 14; pl. xciii., fig. 10.
1897. *Bradypontius Normani*, T. Scott, 15th Ann. Rept. Fishery Board for Scotland, pt. iii., p. 154, pl. ii., figs. 1, 2; pl. iii., figs. 1–11.
1899. *Cribropontius Normani*, Giesb., Die Asterocheriden des Golfes von Neapel, p. 86, pl. 7, figs. 40–47.

This fine species was obtained in the same gathering with the one last recorded, and is the first time it has been noticed in the Firth of Forth. As will be observed from the synonymy, the genus-name has undergone several changes. Moreover, the colour of the living specimens, as shown by the drawings given in the 15th Annual Report of the Fishery Board for Scotland, is somewhat singular, and more ornate than is usually met with amongst the copepod-fauna of our seas; unfortunately, however, the bright colouration is very evanescent in specimens preserved in alcohol.

Bradypontius magniceps (G. S. Brady).

1880. *Artotrogus magniceps*, Brady, Mon. Brit. Copep., vol. iii., p. 61, pl. xciii., figs. 1–9.
1895. *Bradypontius magniceps*, Giesb., Sub-fam., gen., and sp. of the Copepod Fam. Ascomyzontidæ, Thorell; Ann. Mag. Nat. Hist., (6), vol. 16, p.

This, which is also a moderately large species, was obtained in a gathering of dredged material collected at the north-west end of Inchkeith on May 23rd, and in another gathering collected near North Craig on July 4th, 1901; one or two of the female specimens obtained in the last gathering were carrying ovisacs.

Bradypontius magniceps, though apparently widely distributed, is not very common, very few specimens being found in any single gathering.

Cancerilla tubulata, Dalyell. Pl. XXV., fig. 7.

1857. *Cancerilla tubulata*, Dalyell, The Powers of the Creator, vol. i., p. 233, pl. xxii., figs. 1–5.
1892. *Cancerilla tubulata*, Canu, Les Copépodes du Boulonnais, p. 255, pl. xxix., figs. 5–13.

A female specimen (fig. 7) of *Cancerilla tubulata* was obtained in a gathering of crustacea collected in the deep water (60 fathoms) off Aberdeen on August 2nd, 1901. The species, which appears to be rare in the British seas, has been recorded by Mr I. C. Thompson from the Irish Sea*, and Dr. Canu has described it in his work on the Copepods found near Boulogne.† This is the first time I have met with it notwithstanding that a careful look-out for it has been kept up for several years.

In 1893, T. and A. Scott recorded *Caligidium vagabundum*, Claus, from the Moray Firth‡. This copepod Canu in 1892 § and more

* Additions to the Copepoda of Liverpool Bay, *Trans.* L'pool Biol. Soc., vol. ix. (1893) p. 101.
† Les Copépodes du Boulonnais, p. 255, pl. xxix., figs. 5–13 (1892).
‡ Ann. and Mag. Nat. Hist., (6), vol. xii., p. 343 (October, 1893).
§ Les Copépodes du Boulonnais, p. 256.

recently Giesbrecht* have described as the male of *Cancerilla*. There is in some respects a similarity in the structure of *Caligidium* with that of *Cancerilla*, but I am not sure that the relationship between the two has been fully established. Dr. Edward Graeffe in his fauna of the Gulf of Trieste retains *Caligidium vagabundum*, Claus, under its distinctive name, without any reference to its sexual relationship with *Cancerilla*. †

HERPYLLOBIIDÆ.

Salenskya tuberosa, Giard and Bonnier. Pl. XXV., figs. 17–22.

1895. *Salenskya tuberosa*, Giard and Bonnier, Contrib. á l'étude des Epicarides ; Bull. Scient., vol. xxv., p. 472, pl. xiii.

A few specimens of this remarkable form were found fixed between the thoracic legs of *Ampelisca spinipes*, Boeck, dredged near North Craig, Firth of Forth, on July 7th, 1901. They agree very closely with the figure of Giard and Bonnier, who obtained a single female and three "pygmy males" on a specimen of the same amphipod from Le Croisie.

The female (fig. 17) measures about ·84 mm. ($\frac{1}{31}$ of an inch) in length, and it is about as broad as long; one or two of the females carried two globular ovisacs, each one being nearly as large as the copepod itself. No appendages are present.

What seem at first sight to be the males, but, as Hansen has shown (Choniostomatidæ, p. 19), are really the larvæ—the adult males being degenerate like the females—(fig. 18) measure about ·15 mm. ($\frac{1}{166}$ of an inch). The anterior segment of the body is comparatively greatly dilated, the remaining segments are small. The antennules are very short, and three (or four) jointed, and furnished with two terminal setæ and a club-shaped appendage represented in the figure (fig. 19). Two pairs of limbs which represent the first and second maxillipeds are shown in figures 12 and 13.

My son, when dissecting the larvæ, was able to make out two pairs of thoracic feet; each foot appeared to be composed of a two-jointed basal part and a single one-jointed branch, which was armed with two small spines on the exterior margin, and four plumose on the inner margin and apex.

This description will be found to differ (possibly by reason of age) from the character shown by Giard and Bonnier, and my figures show a further difference in a greater segmentation of the hinder part of the abdomen.

It is very probable that the parasite is congeneric, and quite possible that it is identical with *Rhizorbina ampliscæ*, Hansen, described from *Ampelisca lævigata*, Lilljeborg, by Hansen, in 1892 (Entomol. Meddelelser, ii., pp. 207–234, pl. iii.), a memoir which I have not yet been able to consult. ‡

Order OSTRACODA.

A considerable number of Ostracoda have been observed in the dredged material examined during the year, but as they apparently all belong to described species which for the most part are more or less generally distributed, I will only refer to the two following which appear to be somewhat rare.

* Fauna u. Flora d. Golfes u. Neapel, vol. xxv., Astrocheriden, pp. 95 and 112, pl. x. figs. 1–11.

† Fauna d. Golfes v. Triest, *Arbeit. d Zoolog. Institute* zu Wien, t. xiii., haft 1, p. 43 (1900).

‡ I desire to express my indebtedness to Prof. D'Arcy W. Thompson for the identification of this interesting crustacean, as well as for other information concerning it.

Sarsiella (?) *capsula*, Norman. Pl. xxv., figs. 27–32.

Three specimens of an Ostracod—a *Sarsiella*—were obtained in some sand collected about twenty-two miles to the north of the Shetland Islands on May 17th, 1901. The sand had been for a time immersed in formaline, and this may probably be the reason why the shells of these specimens are comparatively soft and, when seen from the side (fig. 27), show a somewhat even surface instead of being solid, and with the surface more or less corrugated as seen in typical specimens (see Part II. of Monograph published by Professor G. S. Brady and the Rev. A. M. Norman*).

The specimen represented by the drawing (fig. 27) is that of a female, and the shell when seen from the side is somewhat obliquely rotundate, the length being rather greater than the height, and measuring about 1·2 mm. by ·9 mm. respectively; the produced posterior projection is finely ciliated, the ventral margin is also fringed with delicate hairs. The posterior end is slightly compressed and bounded by an indistinct ridge which extends obliquely across from the dorsal to the ventral margins. The surface of the shell is not rugose as in the typical *Sarsiella capsula*, but is ornamented with numerous minute pits.

In the dorsal view of the shell given in figure 28, the valves are open to some extent on the ventral aspect; this was due to the soft structure of the shell (the shell could not be mounted dry in the usual way, but had to be kept in water under a cover-glass while being figured).

The various appendages of the contained animal resemble the drawings given in the Monograph by Brady and Norman already referred to.

The secondary appendages of the antennæ are rudimentary. Each consists of a rounded tubercle bearing *two* small spiniferous setæ (fig. 30A). The caudal lamina is provided with six spines on the one side, but only five on the other; on this side there is no trace of a sixth spine, nor any indication that a sixth had been present but had been broken off.

In this specimen two ova were observed.

The shell of the male differed little, if at all, from that of the female, except that it was slightly smaller. The appendages also appeared to be similar, except that the secondary branches of the antennæ were, as in closely allied species, more developed and fitted for grasping, and that the caudal lamina was only provided with five spines on both sides.

The first joint of the autennules in the male is rather longer than the next, and the second, third, and fourth joints gradually decrease in length, the fifth joint is almost obsolete, so much so that it is difficult to make out whether there is really a fifth joint or not. There are no setæ on the first joint; the second joint is furnished with a small seta near the middle of the upper margin, and another on its lower and its upper distal angles; the third joint bears one seta on the upper and two on the lower distal angles, while the fourth and (?) fifth joints carry several terminal setæ as shown in the drawing (fig. 29); some of these hairs have an annulated structure, but this is not shown in the drawing.

The antennæ of the male are provided with a number of long plumose setæ, and the secondary branches, though somewhat rudimentary (fig. 30), are moderately elongated and are apparently four-jointed—the two middle joints being very small; there is also a minute terminal appendage.

The first maxillæ (fig. 31) are similar to those of the female in structure and armature.

* A Monograph of the Marine and Fresh-water Ostracoda of the North Atlantic and of North-western Europe, Part II., *Sci. Trans.* Roy. Dublin Soc., vol. v. ser. ii. (January, 1896), p. 677, pl. lx., figs. 1–4, 18.

The caudal lamina of the male appears to have only five spines on both sides (fig. 32), no trace of a sixth could be observed.

The male described and figured here does not agree with *Nematohamma obliqua*, Brady and Norman, the structure of the antennæ and of the secondary branches of the antennules differs considerably from that of the same appendages in *N. obliqua*.

No male of *Sarsiella capsula* appears to have been described hitherto.

Conchœcea elegans, G. O. Sars. Pl. xxv., fig. 33.

A specimen of this species was dredged 180 miles north-east from Buchan-ness (about sixty miles to the east of the Shetland Islands) on May 22nd, 1901. Another specimen was obtained in the stomach of a whiting captured in 65 fathoms about 10 miles off Aberdeen on the 19th of the same month.

Order BRANCHIOPODA.

POLYPHEMEDÆ.

Genus *Podon*.

Three species of *Podon* have been described from the North Sea viz. *Podon polyphemoides*, Leuckart, *Podon leuckartii*, G. O. Sars, and *Podon intermedius*, Lilljeborg, and two of these—the first and the third—have sometimes been included in lists of British Crustacea; there is a probability, however, that *Podon leuckartii* has sometimes been mistaken for *P. polyphemoides*, and as I have, with the assistance of Professor Lilljeborg's great work on Swedish Cladocera recently published, been enabled to recognise *Podon leuckartii* in some tow-net gatherings from the Firth of Forth and also from the Moray Firth, I will here indicate what seem to be the more obvious differences between this species and *Podon intermedius*, which is occasionally observed in the Firth of Clyde, and between both of these and *Podon polyphemoides*.

Podon leuckartii (G. O. Sars). Pl. XXV., figs. 23, 24.

The specimen represented by the drawing measures about a millimetre in length. The lower branches of the antennæ are composed of three, the upper of four joints as in the other two species referred to above; the joints of the lower branches are sub-equal in length, and the first two bear each one and the last four terminal setæ, the first joint of the upper branches is very small, but other three are larger and sub-equal in length, and are provided with the same number of setæ as the lower branches (fig. 24).

The caudal spines are strong and slightly curved, and are rather longer than the caudal spines of *Podon intermedius*.

Habitat.—Firth of Forth and the Moray Firth.

The species does not appear to be rare on the east of Scotland: it has probably been mistaken for *Podon polyphemoides*.

Podon intermedius, Lilljeborg. Pl. XXV., figs. 25, 26.

1853. *Podon intermedius*, Lilljeborg, De Crust. ex ordinibus tribus: Cladocera, Ostrocoda, Copepoda, in Scania occurr., sec. ii.; da Crust. Marina, Ord. Clad., p. 161.

The specimen represented by the drawing measures about 1·5 mm. The antennae (second antennæ) are somewhat similar in structure to those

of *Podon leuckartii*, and the lower branches are provided with the same number of setæ ; but the upper branches differ in being furnished with an additional seta on the penultimate joint—one of the setæ springs from the middle of the joint and the other from its distal end—this branch, therefore, carries seven instead of six setæ (fig. 26).

The caudal spines are moderately stout, and straight, but smaller than those of *Podon leuckartii* (fig. 25).

Habitat.—Firth of Clyde, not very rare. It may be readily distinguished from *Podon leuckartii* by having an additional seta on the upper branches of the antennæ and by the caudal spines being smaller and straight.

Podon polyphemoides, Leuckart—a species considerably smaller than the other two—is, like *Podon intermedius*, provided with seven setæ on the upper branches of the antennæ, but the end joints of both branches are distinctly shorter than the preceding joints ; the supplementary seta on the penultimate joint of the upper branches springs from near the distal end instead of near the middle of the joint. The caudal spines are also smaller. Probably *Podon leuckartii* has sometimes been mistaken for this species.*

Order EDRIOPHTHALMA.

Sub-Order AMPHIPODA.

Many species belonging to the Amphipoda have been observed in tow-net gatherings, in dredged material, and in the stomachs of fishes examined during the past year, but only some of the rare forms are recorded here.

Pontoporeiidæ.

Bathyporeia norvegica, G. O. Sars, occurred in a tow-net gathering collected in Aberdeen Bay on September 4th, 1901. *Argissa hamatipes* (Norman) was also observed in some of the gatherings collected off Aberdeen during the past year.

Phoxocephalidæ.

The only species belonging to this family which may be noted is the *Phoxocephalus oculatus*, G. O. Sars ; it was obtained in a tow-net gathering collected about 22 miles to the north of the Shetland Islands on May 17th, 1901.

Ampeliscidæ.

Several species of the Ampeliscidæ have been observed, not only in gatherings collected with the tow-nets and dredge, but also in the stomachs of fishes, with whom they appear to be a favourite kind of food. The following species were observed :—*Ampelisca macrocephala* has occurred in gatherings from the Firth of Forth, from off Aberdeen, and from the Shetland district. *Ampelisca assimilis* has been obtained in gatherings and in fishes' stomachs from the Firth of Forth and Collieston, Aberdeenshire. *Ampelisca spinipes* was obtained in dredgings from the Firth of Forth (with parasites attached) and in the

* All the three species of *Podon* mentioned above have recently been obtained in some tow-net gatherings from the Firth of Clyde collected for the most part in April and May and in July and August 1901; *P. leuckartii* was obtained in the spring gatherings, but not in those collected later ; while the other two species were observed in these later gatherings only.

stomachs of fishes. *Ampelisca brevicornis* (A. Costa), occurred in fishes' stomachs from the Shetland district and the Firth of Forth ; and *Haploops tubicola* was also obtained in the Forth estuary and off Aberdeen.

Stegocephalidæ.

Stegocephaloides (?) *christianiensis* (Boeck). Pl. XXV., figs. 34–40.

Stegocephaloides christianiensis has again been observed in Loch Fyne, where it appears to be generally, though sparingly, distributed. Three specimens of what seems to be a variety of this species was dredged by the "Garland" in the Sound of Mull in 72 fathoms on March 31st, 1900. The fourth pair of coxal plates in these specimens are scarcely so broad in proportion to their length as in the typical forms (fig. 34). The basal joints of the last pereiopods do not terminate so acutely, but have the ends slightly rounded (fig. 38). The last epimeral plates of the metasome do not appear to be minutely notched on the low distal angles (fig. 39) ; and the telson seems to be slightly broader in proportion to its length (fig. 40). The other parts are similar to those of *Stegocephaloides christianiensis.*

Amphilochidæ.

The somewhat rare *Amphilochus tenuimanus*, Boeck, was obtained in the stomach of a small Whiting from Station III., Firth of Forth, in April. *Amphilochoides intermedius* was dredged at the same station on May 25th. *Gitana sarsii*, Boeck, was also obtained in this gathering, along with a few other species noticed in the sequel.

Metopidæ.

Metopa pusilla, G. O. Sars, was obtained in some dredged material from the west end of Station III. collected in May, and in similar material from Stations V. and VII. collected in April—all from the Firth of Forth. *Metopa pollexiana* was obtained in gatherings collected off Aberdeen and to the east of the Shetland Islands ; it was also dredged at the west end of Station III., Firth of Forth, on May 23rd, 1901, and *Sthenometopa* (*Metopa*) *robusta* (G. O. Sars) was also obtained in the same gathering, as well as off the North Craig—also in the Firth of Forth—in 8 fathoms, in July.

Dexaminidæ.

The somewhat rare *Guernia coalita* (Norman) has been dredged in the Firth of Forth, where it has been previously observed ; it was also dredged at Smith Bank in the Moray Firth, in 24 fathoms, on February 15th, and in Loch Linnhe in 48 fathoms on September 12th, 1901.

Gammaridæ.

Mœra loveni (Bruzel.) was obtained in the stomach of a Witch-sole, *Pleuronectes cynoglossus*, captured at Station V., Firth of Forth, by the "Garland" on June 28th, 1901 ; this is one of the rarer species in the Firth estuary. *Megaluropus agilis*, Norman, was obtained in gatherings of dredged material from Stations IV. and V., Firth of Forth, on the 22nd and 24th April ; while *Cheirocrates sundevalli* (Rathke) and *Cheirocrates assimilis* (Lilljeborg) were dredged at the north-west end of Inchkeith, Firth of Forth, on May 23rd, 1901.

Lilljeborgiidæ.

Lilljeborgia kinahani (Bate) occurred in some dredged material collected at Stations III. and VI., Firth of Forth, in May and June; the species appears to be somewhat rare in the Firth of Forth.

Photidæ.

The following species belonging to this family were observed during the year. *Leptocheirus pilosus*, Zaddach, was dredged at the north-west end of Inchkeith on May 23rd. (This is the form described by G. O. Sars, having a six-jointed accessory appendage to the antennules.) *Protomedeia fasciata*, Kröyer, was obtained on several occasions in the stomachs of fishes.

Megamphopus cornutus, Norman, was dredged at Smith Bank, Moray Firth, on February 15th, and also at Stations III. and V., Firth of Forth, in April and May, 1901; it was also observed in the stomachs of small Whiting captured off Aberdeen on September 3rd.

Corophiidæ.

I record two species belonging to this family. *Corophium affine*, Bruzelius, a male specimen, was obtained in the stomach of a small Whiting collected about ten miles off Aberdeen, in 55 to 60 fathoms, on September 3rd, 1901. *Unciola planipes*, Norman, was obtained in 78 fathoms about 110 miles north-east of Buchan-ness on May 15th, 1901.

Dulichiidæ.

Three species of *Dulichia* have during the past year been obtained in the Firth of Forth. *Dulichia porrecta*, Bate, was dredged at the west end of Station III. on May 23rd, and *Dulichia falcata*, Bate, at Station V. on April 24th. *Dulichia monacantha*, Metzger, which is new to the crustacean fauna of the Forth, was obtained in dredged material from Stations V. and VII. in April; all three species have also been observed in stomachs of fishes examined during the year.

Sub-Order ISOPODA.

Typhlotanais brevicornis (Lilljeborg). This minute isopod, which is only about 1·5 mm., was dredged in 50 to 55 fathoms, about 14 miles off Buckie, on November 3rd, 1900. So far as I know, this is the first representative of the genus *Typhlotanais* which has been recorded from the British seas.

Idothea granulosa, Rathke. Pl. XXV., fig. 41.

Two specimens of a small *Idothea* captured in the Bay of Nigg on March 23rd, 1901, agree with the *Idothea granulosa* of Rathke, as figured in Sars' Isopoda of Norway. The specimen represented by the drawing is a female with ova, and measures about 12·7 mm. ($\frac{1}{2}$ an inch) in length.

Sub-Order SYMPODA.

The following, amongst other species belonging to this sub-order, have been observed:—*Iphinoë serrata*, Norman, was obtained in a gathering collected to the east of Shetland on the 15th of May. *Diastylis rostrata*

and *lucifera* were dredged at Station V., Firth of Forth, in April, the one on the 24th and the other on the 26th. *Diastylis tumida*, Lilljeborg, was obtained in a bottom tow-net gathering from 60 fathōms, about ten miles off Aberdeen, collected on August 21st, and *Pseudocuma similis*, G. O. Sars, was dredged at Smith Bank, Moray Firth, on February 15th, and at Station V., Firth of Forth, on April 24th; this is an addition to the crustacean fauna of the Forth. The two species belonging to the Cumellidæ, *Cumella pygmæa*, G. O. Sars, and *Nannastacus unguiculatus*, Bate, were obtained in some bottom mud brought up in a tow-net about 22 miles to the north of the Shetland Islands on May 17th. *Cumella* was also observed in a gathering collected in Uyea Sound between Unst and Uyea Island on the 18th, and also in some dredged material from the west end of Station VI., Firth of Forth, collected on the 22nd of the same month. In this last gathering the somewhat rare but widely distributed *Pseudocuma pulchella*, G. O. Sars, was also obtained.

Order PODOPHTHALMA.

Sub-Order SCHIZOPODA.

In the gatherings forwarded by the "Garland" from the Firth of Forth during the past year, the schizopod *Erythrops goesii* was, as usual, of frequent occurrence. Previous to the investigations instituted by the Fishery Board this species had not been recognised as a member of the British fauna. *Erythrops elegans*, G. O. Sars, has also been obtained in the Forth estuary during the past year, and the curious copepod-parasite *Aspidoecia normani*, Giard and Bounier, was found adhering to a specimen of both *Erythrops elegans* and *goesii*. *Siriella armata* (M. Edw.) was obtained in the Firth of Forth in a bottom tow-net gathering from Station IV. collected on April 22nd, and *Siriella crassipes* in a gathering from Station V. collected on April 24th. *Mysidopsis angusta*, G. O. Sars, was obtained in the same gathering with *Siriella crassipes*, and in a gathering from Smith Bank, Moray Firth. *Rhoda raschii* (M. Sars) was, as usual, frequent in many of the gatherings forwarded to the Laboratory. It will be observed that the Rev. Mr. Stebbing has restored Mr. Sim's generic name *Rhoda* for the group to which this species belongs.*

Sub-Order MACRURA.

Pasiphæa sivado (Risso) was obtained in 95 fathoms in Loch Linnhe on April 2nd, 1900, but the tow-net gathering in which it occurred was not examined till the following March. A specimen of *Pandalus montagui* (with *Phryxus* (?) *abdominalis* attached) was found in a gathering from Station III., Firth of Forth, collected on May 9th. A specimen of *Spirontocaris securifrons*, Norman, which also had a *Phryxus* (?) *abdominalis* attached to its abdomen, occurred in a bottom tow-net gathering collected in 78 fathoms, 110 miles north-east of Buchan-ness, on May 15th, while *Spirontocaris pusiola*, with what appeared to be the same species of parasite, was obtained in a gathering collected in the Forth to the west of Queensferry on April 26th. *Crangon* (*Cheraphilus*) *nanus* was obtained at Station V. on April 26th, and *Calocaris macandreæ* was obtained at the same station as well as at Station III.; this Macrurid

* Arctic Crustacea: Bruce Collection, by the Rev. T. R. R. Stebbing, *Ann. and Mag. Nat. Hist.* (7), vol. v. (Jany. 1900), p. 10.

was found in the stomachs of the Long-rough Dab and the Witch Sole as well as amongst the contents of the small-mesh trawl-net. The *Trachelifer* stage of *Jaxea nocturna*, Nardo, was collected in abundance in the surface tow-net in Tobermory Bay, Sound of Mull, after dark, on September 9th, 1901. The same organism has lately been recorded by my son from the Barrow Channel, near Barrow-in-Furness.† The occurrence of *Trachelifer* at three different places seems to indicate a somewhat extended distribution for this crustacean.

Additional Note.

Cancerina confusa, T. Scott, 19th Ann. Rept. of the Fishery Board for Scotland, pt. iii., p. 252, pl. xviii. figs. 12–20.

The copepod described under this name is identical with *Selioides bolbroei*, Levinsen (Vidensk Meddel. Naturh. Forening Kjöbenhaven. 1878, p. 373, *Crust. Copep.* parasit.); see also *Seloides*, *op. cit.* (1877). This copepod is said to be parasitic on *Harmothoe imbricata* (Lin.).

A marked peculiarity in this copepod is the position occupied by the ovisacs, as shown by the drawing in the Report of the Fishery Board for Scotland mentioned above. I have to thank the Rev. A. M. Norman for drawing my attention to the paper by Levinsen, and also for permitting me to examine the specimens he had received from that author.

Eurynotus insolens, T. and A. Scott, Ann. and Mag. Nat. Hist. (7), vol. i., p. 188 (1898); and *Eurynotopsyllus insolens*, T. Scott, 19th Ann. Rept. of the Fishery Board for Scotland, pt. iii., p. 256.

I am obliged to Dr. Steuer of Trieste for pointing out to me that this species is probably identical with *Eunicicola Clausii*, Kurz.—a parasite on a species of *Eunice*—one of the Annelida.

† Fifteenth Annual Report of the L.M.B.C., 1901, p. 13.

EXPLANATION OF THE PLATES.

PLATE XXII.

Metridia longa (Lubbock). Diam.

Fig. 1. Female, dorsal view . . . . . × 18·6.
Fig. 2. Male, dorsal view . . . . . × 23.
Fig. 3. Foot of fifth pair, female . . . . . × 77.
Fig. 4. Foot of fifth pair, male . . . . . × 77.

Phœnna, zetlandica, sp. n.

Fig. 5. Male, dorsal view . . . . . × 22.
Fig. 6. Foot of fifth pair . . . . . × 77.
Fig. 7. Terminal part of fifth pair of feet . . . . × 525.

Xanthocalanus (?) *borealis*, G. O. Sars.

Fig. 8. Female, dorsal view . . . . . × 18·6.
Fig. 9. Foot of fifth pair . . . . . × 115.

Ectinosoma melaniceps, Boeck, var.

Fig. 10. Female, side view . . . . . × 77.
Fig. 11. Antennule . . . . . × 175.
Fig. 12. Mandible and palp . . . . . × 210.
Fig. 13. First maxilliped . . . . . × 262.
Fig. 14. Second maxilliped . . . . . × 350.
Fig. 15. Foot of fifth pair . . . . . × 210.
Fig. 16. Part of abdomen and caudal furca . . . . × 102.

Stenhelia confusa, sp. n.

Fig. 17. Female, side view . . . . . × 61.
Fig. 18. Antennule . . . . . × 233.
Fig. 19. Antenna . . . . . × 233.
Fig. 20. Mandible and palp . . . . . × 162.
Fig. 21. Second maxilliped . . . . . × 525.
Fig. 22. Foot of first pair . . . . . × 233.
Fig. 23. Foot of fourth pair . . . . . × 175.
Fig. 24. Foot of fifth pair . . . . . × 350.
Fig. 25. Part of abdomen and caudal furca . . . . × 87.

Leptopontia curvicauda, nov. gen. et sp.

Fig. 26. Female, side view . . . . . × 154.
Fig. 27. Antennule . . . . . × 350.
Fig. 28. Antenna . . . . . × 525.
Fig. 29. Mandible and palp . . . . . × 700.
Fig. 30. Second maxilliped . . . . . × 630.
Fig. 31. Foot of first pair . . . . . × 525.
Fig. 32. Foot of second pair . . . . . × 525.
Fig. 33. Foot of fourth pair . . . . . × 350.
Fig. 34. Foot of fifth pair . . . . . × 700.
Fig. 35. Part of abdomen and caudal furca . . . . × 350.

Ameira propinquca, sp. n.

Fig. 36. Male, side view . . . . . × 38.
Fig. 37. Antennule, male . . . . . × 117.
Fig. 38. Antenna . . . . . × 175.
Fig. 39. Mandible and palp . . . . . × 262.
Fig. 40. Foot of first pair . . . . . × 175.
Fig. 41. Foot of third pair . . . . . × 105.
Fig. 42. Part of abdomen and caudal furca . . . . × 103.

PLATE XXIII.

Ameira propinquca, n. sp.

Fig. 1. Foot of third pair, male . . . . . × 183.

Normanella attenuata, A. Scott.

Fig. 2. Female, side view . . . . . × 77.
Fig. 3. Foot of first pair . . . . . × 262.
Fig. 4. Foot of fifth pair . . . . . × 262.

Fultonia hirsuta, nov. gen. et sp.

Fig. 5. Female, side view . . . . . × 103.
Fig. 6. Antennule . . . . . × 262.
Fig. 7. Antenna . . . . . × 525.
Fig. 8. Second maxilliped . . . . . × 525.
Fig. 9. Foot of first pair . . . . . × 467.
Fig. 10. Foot of fourth pair . . . . . × 350.
Fig. 11. Foot of fifth pair . . . . . × 262.
Fig. 12. Part of abdomen and caudal furca . . . . × 154.

Nannopus palastris, Brady.

Fig. 13. Female, dorsal view . . . . . × 92.
Fig. 14. Male, dorsal view . . . . . × 92.
Fig. 15. Antennule, female . . . . . × 350.
Fig. 16. Antenna ,, ... × 350.
Fig. 17. Mandible and palp, female . . . . . × 350.
Fig. 18. Second maxilliped, ,, ... × 700.
Fig. 19. Foot of first pair, ,, ... × 262.
Fig. 20. Foot of second pair, ,, ... × 262.
Fig. 21. Foot of fourth pair, ,, ... × 210.
Fig. 22. Foot of fifth pair . . . . . × 262.
Fig. 23. Antennule, male . . . . . × 262.
Fig. 24. Foot of third pair, male . . . . . × 262.
Fig. 25. Foot of fifth pair and appendage to first abdominal segment . × 262.

Cletodes longicaudata, Brady and Robertson.

Fig. 26. Female, side view . . . . . × 102.
Fig. 27. Antennule . . . . . × 350.
Fig. 28. Antenna . . . . . × 350.
Fig. 29. Foot of first pair . . . . . × 262.
Fig. 30. Foot of second pair . . . . . × 262.
Fig. 31. Foot of fourth pair . . . . . × 262.
Fig. 32. Foot of fifth pair . . . . . × 131.
Fig. 33. Part of abdomen and caudal furca . . . . × 131.

Ameira reflexa, T. Scott, var.

Fig. 34. Female, side view . . . . . × 77.
Fig. 35. Antennule . . . . . × 350.
Fig. 36. Antenna . . . . . × 525.
Fig. 37. Mandible and palp . . . . . ×1050.
Fig. 38. Second maxilliped . . . . . × 525.
Fig. 39. Foot of first pair . . . . . × 350.
Fig. 40. Foot of fourth pair . . . . . × 131.
Fig. 41. Foot of fifth pair . . . . . × 131.
Fig. 42. Part of abdomen and caudal furca . . . . × 315.

PLATE XXIV.

Ameira tenuicornis, sp. n.

Fig. 1. Female, side view . . . . . × 103.
Fig. 2. Antennule . . . . . × 262.
Fig. 3. Antenna . . . . . × 350.
Fig. 4. Mandible and palp . . . . . × 630.
Fig. 5. Second maxilliped, enlarged . . . . . ×
Fig. 6. Foot of first pair . . . . . × 210.
Fig. 7. Foot of fourth pair . . . . . × 175.
Fig. 8. Foot of fifth pair . . . . . × 350.
Fig. 9. Part of abdomen and caudal furca . . . . × 210.

Ameira propinquca, sp. n.

Fig. 10. Female, side view . . . . . × 103.
Fig. 11. Antennule . . . . . × 350.
Fig. 12. Antenna . . . . . × 350.
Fig. 13. Mandible and palp . . . . . × 525.
Fig. 14. Second maxilliped . . . . . × 700.
Fig. 15. Foot of first pair . . . . . × 467.
Fig. 16. Foot of fourth pair . . . . . × 262.
Fig. 17. Foot of fifth pair . . . . . × 350.
Fig. 18. Part of abdomen and caudal furca . . . . × 275.

Stenhelia hispida, Brady.

Fig. 19. Female, side view . . . . . × 51.
Fig. 20. Antennule . . . . . × 175.
Fig. 21. Antenna . . . . . × 262.
Fig. 22. Mandible and palp . . . . . × 420.
Fig. 23. Second maxilliped . . . . . × 350.
Fig. 24. Foot of first pair . . . . . × 175.
Fig. 25. Foot of fourth pair . . . . . × 175.
Fig. 26. Foot of fifth pair and appendage to first abdominal segments . × 175.

Pseudomesochra longifurcata, nov. gen. et sp.

Fig. 27. Female, side view . . . . . × 103.
Fig. 28. Antennule . . . . . × 305.
Fig. 29. Antenna . . . . . × 305.
Fig. 30. Mandible and palp . . . . . × 305.
Fig. 31. Second maxilliped . . . . . × 700.
Fig. 32. Foot of first pair . . . . . × 315.
Fig. 33. Foot of fourth pair . . . . . × 315.
Fig. 34. Foot of fifth pair . . . . . × 525.
Fig. 35. Part of abdomen and caudal furca . . . . . × 175.

Pseudopsyllus elongatus, nov. gen. et sp.

Fig. 36. Female, dorsal view . . . . . × 46.
Fig. 37. Antennule . . . . . × 262.
Fig. 38. Antenna . . . . . × 262.
Fig. 39. Second maxilliped . . . . . × 174.
Fig. 40. Foot of first pair . . . . . × 174.
Fig. 41. Foot of fourth pair . . . . . × 117.
Fig. 42. Foot of fifth pair . . . . . × 262.

PLATE XXV.

Scolecithrix (?) *brevicornis*, G. O. Sars.

Fig. 1. Male, dorsal view . . . . . × 38.
Fig. 2. Fifth pair of thoracic feet (slightly damaged) . . . × 77.

Monstrilla longiremis, Giesbrecht.

Fig. 3. Female, dorsal view . . . . . × 19.
Fig. 4. Fifth pair of thoracic feet . . . . . × 51.

Thaumaleus thompsonii, Giesbrecht.

Fig. 5. Male, dorsal view . . . . . × 19.
Fig. 6. Fifth pair of thoracic feet . . . . . × 525.

Cancerilla tubulata, Dalyell.

Fig. 7. Male, dorsal view . . . . . × 51.

Nereicola concinna, T. Scott, sp. n.

Fig. 8. Female, dorsal view . . . . . × 25.
Fig. 9. Antennule . . . . . × 262.
Fig. 10. Antenna . . . . . × 350.
Fig. 11. Mandible . . . . . × 420.
Fig. 12. First maxilliped . . . . . × 262.
Fig. 13. Second maxilliped . . . . . × 350.
Fig. 14. An immature (?) female . . . . . × 47.