

THE ANNALS
AND
MAGAZINE OF NATURAL HISTORY,

INCLUDING
ZOOLOGY, BOTANY, AND GEOLOGY.

(BEING A CONTINUATION OF THE 'ANNALS' COMBINED WITH LOUDON AND
CHARLESWORTH'S 'MAGAZINE OF NATURAL HISTORY.')

CONDUCTED BY
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THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[SEVENTH SERIES.]

“..... per litora spargite muscum,
Naiades, et circum vitreos considite fontes:
Pollice virgineo teneros hic carpite flores:
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas;
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Deæ pelagi, et pingui conchyliis succo.

N. Parthenii Giannettasi, Ecl. 1.

No. 61. JANUARY 1903.

I.—*Notes on the Natural History of East Finmark.* By
Canon A. M. NORMAN, M.A., D.C.L., LL.D., F.R.S.,
F.L.S.

[Continued from vol. x. p. 486.]

[Plates I.-IV.]

CRUSTACEA (continued).

THE gatherings of Copepoda which were brought by me from East Finmark have been placed in the hands of Mr. Thomas Scott, whose knowledge of the smaller and more difficult forms of this order is unsurpassed. I am greatly indebted to him for his report, which makes the account of the Crustacea complete.

The following species, which are not among those collected by myself, have been recorded from East Finmark—the first seven by Professor G. O. Sars*, the *Canthocamptus* by

* Sars (G. O.), 'An Account of the Crustacea of Norway,' vol. iv. Copepoda Calanoida (now in course of publication).

Prof. Lilljeborg* in a paper received during the present month, and the *Balenophilus* by Aurivillius †. *Balenophilus* is described as living on the baleen-plates of *Balenoptera Sibbaldi*, Gray.

Pseudocalanus elongatus, Boeck.
Udinopsis Bradyi, G. O. Sars.
Euchæta norvegica, Boeck.
Diaptomus bacillifer, Koelbel.
 — *laciniatus*, Lilljeborg.
Hetercope borealis, S. Fischer.

Metridia longa, Boeck.
Canthocamptus insignipes, Lilljeborg.
Balenophilus unisetosus, P. O. C. Aurivillius.

Among the Copepoda dredged in the Varanger Fiord was a beautiful new genus which I had procured two years previously in the Firth of Clyde. I have had for some years full drawings of this Copepod ready for publication, and I here give a preliminary notice of it.

ANCORABOLUS †, Norman, gen. nov.

Antennules three-jointed. *Antennæ* without a secondary branch, composed of two elongated joints. *First feet* with the second basal joint produced and bent outwards, with the inner branch attached to the base of this joint, and two-jointed; the second joint terminating in three plumose setæ (instead of the claw which is usual in some allied genera): outer branch also two-jointed. *Second, third, and fourth feet* with second basal joints long, the inner branch two-jointed, the first being small; outer branch three-jointed. *Fifth feet* elongated and slender, inner branch terminating in a narrow elongated lobe of unusual length; outer branch also consisting of a single narrow joint.

The antennæ and second and two following feet in this genus resemble those of the genus *Laophontodes*, but the first and last feet are very different from those of that or of any other allied genus.

Ancorabolus mirabilis, Norman, sp. n.

Cephalosome with a well-developed horizontally directed rostrum, which is cleft at the extremity and bears either one or two pairs of setæ on the sides situated on little protuberances. Cephalosome, metasome, and first three segments of

* Lilljeborg, "Synopsis specierum hucusque in aquis dulcibus Sueciæ observatarum familiæ Harpacticidarum," Kongl. Svenska Vet.-Akad. Handl. vol. xxxvi. (Oct. 1902).

† Aurivillius (P. O. C.), "New Genus and Species of Harpacticida," K. Svenska Vet.-Akad. Handl. vol. v. (1879).

‡ An anchor-caster, ἄγκυρα and βάλλω.

urosome ornamented with a wonderful series of simple, furcate, or three-branched large horn-like processes, which are arranged as follows:—As regards the dorsal surface: on each side of the centre of the hinder margin of the cephalosome is a backward-directed, simple, lancet-shaped, setose process, flanked on the inner side by two minute similar processes; each of the four following segments is furnished with a similar pair of lancet-shaped processes, but devoid of the more minute flanking processes. This dorsal decoration is, however, inconspicuous and of little moment compared with the large appendages borne on the lateral margins, which are as follows:—On each side of the cephalosome there is near the base of the antennule a small simple process*; this is followed by a trifid process, then by a bifid process, this again by another trifid process; these four processes increase in size from the first to the last. The first, second, and third segments of the metasome bear on their side a trifid process similar to the last of those on the cephalosome. On the fourth segment of the metasome and on the first three of the urosome the smaller of the three horns of the trifid process disappears, and the two that remain are more entirely separated from each other at their base and have acquired still greater size; so that the lower and larger of them attains on these segments a length which equals about three quarters of the breadth of the segment from which they spring.

The branches of the caudal furca are very long, nearly equalling the length of the three preceding segments; at half their length there is a spinule on the outer margin, and they terminate in a strong and greatly produced stiliform seta, at the base of which are two or three minute setæ. The length of the furca and its attached setæ is nearly if not quite equal to that of the entire rest of the animal.

Length 0·8 millim.

This is a most extraordinary and beautifully constructed species. Only one other genus of the Harpacticoida has yet been found which surpasses *Ancorabolutus* with respect to the remarkable development of the body ornament: that species is the wonderful *Pontostratiotes abyssicola*, G. S. Brady, of the 'Challenger' Expedition, which was dredged on the bed of the North Atlantic, lat. 37° 29' S., long. 27° 31' N., in 2200 fathoms.

Ancorabolutus mirabilis was first dredged in 1888 in the Firth of Clyde, when I was a guest of Sir John Murray in his steamer the 'Medusa.' It was blowing rather hard for dredging, and we ran under the lee of the east side of Little

* This first small simple process appears to be sometimes absent.

Cumbræ and let down the dredge in about 20 fathoms. It came up filled with nothing but decaying seaweeds, which had been drifted together to that spot and which looked absolutely rubbish. But long experience had taught me that the most unlikely places sometimes produce most interesting things. I consequently worked some of this dead stuff through sieves in a tub of water, and that water having been passed through a muslin bag, the contents of the bag was bottled. Very few Crustacea were found on examination, but nevertheless there were three species new to Britain and two of them new to science—the Cumacean *Campylaspis sulcata*, G. O. Sars, the present species of *Ancorabolus*, and a second species of the same genus.

It is curious that two years after I should have a second time met with *A. mirabilis* at such a distance from its first-known habitat in the Varanger Fiord.

Notes on some Copepoda from the Arctic Seas collected in 1890 by the Rev. Canon A. M. Norman, F.R.S. By THOMAS SCOTT, F.L.S.

The Copepoda recorded here are for the most part members of the family Harpacticidæ, but a few belong to other groups; they were collected by the Rev. A. M. Norman about the end of June and beginning of July, 1890, while on a visit to the Lofoten Islands and East Finmark, and I desire to express my indebtedness to him for permitting me to examine and record them. I have also to acknowledge the valuable assistance rendered by my son, Mr. Andrew Scott, in the identification of the smaller and doubtful species and for the drawings necessary to illustrate some of the descriptions of rare or apparently new forms.

The species and varieties recorded number sixty-four, and they belong to thirty-two genera. The localities where they were obtained are as follow:—Svolvær, Lofoten Islands; and in East Finmark from Lakse Fiord, Vadsö, Varanger Fiord, Bög Fiord, and Klosterelv Fiord. The following are the species identified or described:—

Fam. Calanidæ.

Genus CALANUS, Leach, 1816.

Calanus finmarchicus (Gunnerus).

One or two specimens, slightly immature, but apparently belonging to this species, were obtained in a gathering from Bög Fiord.

Fam. Phaënidæ, G. O. Sars.

Genus PSEUDOPHAËNNA, G. O. Sars, 1902.

? *Pseudophaëнна typica*, G. O. Sars.1902. *Pseudophaëнна typica*, G. O. Sars, The Crustacea of Norway, vol. iv. (Copepoda), parts iii. & iv. p. 44, pls. xxix., xxx.

Two imperfect specimens which appear to belong to this species occurred in the same gathering with *Calanus finmarchicus*. Prof. G. O. Sars obtained *Pseudophaëнна typica* at several places on the Norwegian coast from Christiania Fiord to Vardø, and adds that it is a true bottom form.

Fam. Stephidæ, G. O. Sars.

Genus STEPHOS, T. Scott, 1892.

Stephos lamellatus, G. O. Sars.1902. *Stephos lamellatus*. G. O. Sars, *op. cit.* parts v. & vi. p. 62, pls. xli., xlii.

A few specimens (male and female) of this distinct species were also obtained in the same gathering from Bög Fiord with the species just recorded. Sars states that he obtained it not unfrequently at Bodö and Hammerfest, Finmark, in depths of about 30 fathoms, muddy bottom, and occasionally off the west coast of Norway at Christiansund. In *Stephos lamellatus* the fifth pair of thoracic feet of the male are moderately stout and prominent and the right leg terminates in a fascicle of digitiform appendages, which form one of the more distinctive characters of the species.

Fam. Diaptomidæ.

Genus DIAPTOMUS, Westwood, 1836.

Diaptomus graciloides, Lilljeborg.1858. *Diaptomus graciloides*, Lilljeborg, Bull. Soc. Zool. de France, vol. xiii. p. 156.

This *Diaptomus* was common in a gathering from a small lake at Kirkenes, East Finmark, collected in July 1890. Sars states that it is not unfrequent in small tarns at Hammerfest and at Matsjok in Finmark. It appears to be a widely distributed species; it has been recorded by Prof. G. S. Brady from the British Islands.

Fam. Temoridæ.

Genus HETEROCOPE, G. O. Sars, 1863.

Heterocope appendiculata, G. O. Sars.1863. *Heterocope appendiculata*, G. O. Sars, Oversigt af de indenlandske Ferskvandes-Copepoder, p. 224.

Specimens of this *Heterocope* occurred very sparingly in the gathering from the lake at Kirkenes containing the *Diaptomus graciloides*. The appendages on the underside of the first abdominal segment of the female appear to be peculiar to this species. G. O. Sars speaks of it as abundant in the great lakes of Norway, and it has been recorded by Nordquist from several lakes in the south-east of Finland. The species seems to have a wide distribution in Northern Europe.

Fam. Cyclopidæ.

Genus CYCLOPINA, Claus, 1863.

Cyclopina gracilis, Claus.1863. *Cyclopina gracilis*, Claus, Die frei lebenden Copepoden, p. 104, t. x. figs. 9-15.

This species was observed sparingly in a gathering from Vadsö, but in none of the others; it appears, however, to have a wide distribution.

Cyclopina Schneideri, sp. n. (Pl. I. figs. 1-6.)

Description of the female.—The specimen represented by the drawing (fig. 1) measures rather more than 1 millim. in length. The cephalothorax, which is moderately robust, is fully one and a half times the length of the slender abdomen. The forehead is rounded, and the antennules, which scarcely reach to the end of the cephalic segment, are composed of twelve joints (fig. 2). The structure of the antennules resembles very closely that of the antennules of *Cyclopina gracilis*, Claus; but in the present species there are six small end joints, instead of five. The formula shows approximately the proportional lengths of the various joints:—

Numbers of the joints. .	1	2	3	4	5	6	7	8	9	10	11	12
Proportional lengths ..	12	7	11	5	7	22	4	4	5	3	4	6

The antennæ also resemble the same appendages in *Cyclopina gracilis*; they are composed of four joints, the penultimate one being the shortest (fig. 3).

The mandibles (fig. 4) are short and stout and have a broad dentated biting-end; the palp is large and two-branched. The other mouth-organs appear to be similar to those of *Cyclopina littoralis*, G. S. Brady.

All the four pairs of swimming-feet, which also resemble those of that species, are comparatively short and have both branches of about equal length and composed of three joints; fig. 5 represents the first pair, and the other three are somewhat like this in form and structure.

The fifth pair are small and are each composed of two moderately broad joints (fig. 6); the first joint bears a single subapical seta, but the end joint is armed with two spines, one at each distal angle, and a small intermediate seta.

The genital segment of the abdomen appears to consist of two coalescent segments and is about equal to half the entire length of the abdomen; the remaining three segments are comparatively short (fig. 1).

The caudal furcæ are scarcely equal in length to the last segment of the abdomen.

I am very pleased to accede to the request of the Rev. A. M. Norman to name this distinct species after the well-known Norwegian carcinologist Herr J. Sparre Schneider, who was Dr. Norman's companion in his expedition of 1890.

Hab. Vadsö Sound, East Finmark; rather rare. No males were observed.

Remarks. *Cyclopina Schneideri*, as already stated, is in some respects not unlike *Cyclopina gracilis*, Claus, but it differs in having more robust mandibles and in the caudal furca being very short; moreover, it is about double the size of that species. It does not agree satisfactorily with any described species known to me.

Genus EURYTE, Philippi.

Euryte longicauda, Philippi.

1843. *Euryte longicauda*, Philippi, "Fernere Beobachtungen über die Copepoden des Mittelmeeres," Archiv f. Naturg. Jahrg. 9, p. 63, pl. iii. fig. 3, a-d.

1864. *Thorellia brunnea*, Boeck, Oversigt Norges Copepoder, p. 26.

This species was obtained in gatherings from Svolvær, Lofoten Islands; Bög Fiord, Lakse Fiord, Vadsö Sound, and Varanger Fiord, East Finmark, and was of moderately frequent occurrence; the specimens appeared to be for the most part rather larger than those found in Scottish waters.

Genus *CYCLOPS*, O. F. Müller.*Cyclops strenuus*, Fischer.

1851. *Cyclops strenuus*, Fischer, Bull. de la Soc. imp. Naturalistes de Moscou, t. xxiv. (2nd part) p. 419, pl. ix. figs. 12-21.

This species was moderately common in the gathering from Lake Kirkenes along with *Diaptomus graciloides* and *Heterocope appendiculata*. In these specimens the caudal furca appears to be proportionally rather shorter than in those from the Scottish lakes, but, as Dr. Schmeil has shown in his splendid work on the freshwater Copepoda of Germany (1892-96), this, which is a widely distributed species, exhibits a tendency to variation even greater than is observed in some of the other members of the genus.

Cyclops Brucei, T. Scott.

1899. *Cyclops Brucei*, T. Scott, "The Crustacea of Franz-Josef Land," Journ. Linn. Soc., Zool. vol. xxvii. p. 93, pl. vi. figs. 1-6.

A number of specimens of *Cyclops Brucei* were collected near Vadsö; these are identical with those from which the species was described and which were obtained in a pond at Elmwood, near Cape Flora, Franz-Josef Land*. Several of the specimens from Vadsö carried ovisacs.

Fam. Harpacticidæ.

Genus *ECTINOSOMA*, Boeck.*Ectinosoma Sarsi*, Boeck.

1864. *Ectinosoma Sarsi*, Boeck, Nye Slægter og Arter af Saltsvands-Copepoder, p. 45.

1880. *Ectinosoma spinipes*, G. S. Brady, British Copepoda, vol. ii. p. 9, pl. xxxvi. figs. 1-10.

A number of specimens of this *Ectinosoma* were collected in Vadsö Sound, but the species was not observed in the other gatherings; it is one of the larger species of *Ectinosoma*.

Ectinosoma propinquum, T. & A. Scott.

1896. *Ectinosoma propinquum*, T. & A. Scott, Trans. Linn. Soc. 2nd ser. Zool. vol. vi. p. 428, pl. xxxvi. figs. 19, 27, 46, et seq.

This species was obtained very sparingly in gatherings from Lakse, Klosterelv, and Varanger Fiords. In general

* In the original description of *Cyclops Brucei* it is stated inadvertently that the third and fifth joints of the female antennules are the shortest, instead of the third and sixth as shown by the drawing.

appearance and in size *Ectinosoma propinquum* resembles *Ectinosoma Sarsi* and may readily be mistaken for it; but one of the more obvious differences, and one I have found constant in all the specimens examined, is that in *E. propinquum* the fifth thoracic feet are shorter in proportion to their width, *i. e.* each of the fifth pair is about as broad as long, whereas in *E. Sarsi* the length is greater than the width.

Ectinosoma curticorne, Boeck.

1864. *Ectinosoma curticorne*, Boeck, Oversigt Norges Copepoder, p. 13.

Ectinosoma curticorne, which is a small species of a brownish colour, was obtained in Bög Fiord and between tide-marks at Vadsö, but it was less frequent in the Vadsö gathering than in that from Bög Fiord.

Ectinosoma erythrops, G. S. Brady.

1880. *Ectinosoma erythrops*, G. S. Brady, British Copepoda, vol. ii. p. 12, pl. xxxvi. figs. 11-17.

The only gathering in which this species was observed was collected in Lakse Fiord; very few specimens were obtained.

Ectinosoma Normani, T. & A. Scott.

1896. *Ectinosoma Normani*, T. & A. Scott, *tom. cit.* p. 435, pl. xxxvi. figs. 21, 29, 39, pl. xxxvii. figs. 12, 26, 34, 51, pl. xxxviii. figs. 5, 18, 42, 45.

This species occurred very sparingly in a gathering from Vadsö Sound—the only one in which it was observed.

Ectinosoma finmarchicum, sp. n.

(Pl. I. figs. 7-13.)

An *Ectinosoma* which differs to some extent from any species known to me, and which I propose to describe under the above name, was also obtained in Vadsö Sound.

The female (fig. 7) is moderately slender and elongated and has a general resemblance to *Ectinosoma Herdmani*, T. & A. Scott, but the form and especially the armature of the fifth pair of thoracic feet differ to a considerable extent; in the present species the joints of the fifth pair (fig. 13) are rather longer in proportion to their breadth, and the inner one of the two apical setæ on the basal joint and the middle seta of the secondary joint are each of them about twice as long as the others; but in *Ectinosoma Herdmani* the terminal setæ of the fifth pair in the female are all of nearly equal

length. In *Ectinosoma funmarchicum* the form and armature of the fifth pair somewhat resemble the fifth pair in *Ectinosoma Sarsi*, Boeck, but in that species the setæ are shorter.

A form which appears to be the male of this species is somewhat smaller and stouter than the female. The specimen represented by the drawing (fig. 8) measures scarcely .9 millim., but, with the exception of the modified antennules (fig. 10), all the appendages appear to resemble more or less closely those of the female.

Both forms were apparently rare in the gathering from Vadsö Sound.

Ectinosoma atlanticum (Brady & Robertson).

1880. *Ectinosoma atlanticum*, G. S. Brady, *op. cit.* vol. ii. p. 13, pl. xxxviii. figs. 11-19.

A small *Ectinosoma*, which appears to be identical with the species to which I have ascribed it, was obtained rather sparingly in a gathering from Lakse Fiord—the only one in the present collection in which it was observed. The same species has been recorded from Franz-Josef Land and from various other parts of the Arctic Sea.

Genus BRADYA, Boeck, 1872.

Bradya typica, Boeck.

1872. *Bradya typica*, Boeck, *Nye Slægter og Arter af Saltsvands-Copepoder*, p. 15.

This well-marked species was obtained in gatherings from Bög Fiord, Lakse Fiord, and Klosterelv Fiord, but was not very common.

Genus ZOSIME, Boeck, 1872.

Zosime typica, Boeck.

1872. *Zosime typica*, Boeck, *op. cit.* p. 14.

This, which is also one of the more easily recognized species, occurred sparingly in gatherings from Varanger Fiord and Vadsö.

Genus TACHIDIUS, Lilljeborg.

Tachidius discipes, Giesbrecht (= *T. brevicornis*, Brady).

1882. *Tachidius discipes*, Giesb. *Die freilebenden Copepoden Kieler Foeherde*, p. 108, pl. ii. figs. 4 *et seq.*

This species was moderately frequent in a gathering from

Bög Fiord, but was not observed in any of the others. *T. discipes* is not uncommon as a British species, especially in inshore waters and brackish pools.

Tachidius littoralis, Poppe.

1885. *Tachidius littoralis*, Poppe, "Die freilebenden Copepoden des Jodebusens," Abhandl. d. nat. Ver. zu Bremen, Bd. xi. p. 167, t. vii. figs. 10-20.

A number of specimens of *Tachidius littoralis* were obtained in the same gathering with the last. The two species are quite distinct, the difference in the structure of the antennules and fifth thoracic feet in the female being very marked. *T. littoralis* is more a brackish-water species than the other, though they are frequently found living together.

Genus AMYMONE, Claus, 1863.

Amymone spherica, Claus.

1863. *Amymone spherica*, Claus, Die frei lebenden Copepoden, p. 14, t. xx. figs. 1-9.

A few specimens of *Amymone spherica* occurred in a gathering from Lakse Fiord, E. Finmark, and in another from Svolvev, Lofoten Islands. These Copepods are, from their small size and peculiar form, easily missed, unless they are carefully looked for.

Genus STENHELIA, Boeck, 1864.

Stenhelium hirsutum, I. C. Thompson.

1893. *Stenhelium hirsutum*, I. C. Thompson, "Revised Report on the Copepoda of Liverpool Bay," Trans. Biol. Soc. Liverpool, p. 20, pl. xxxi. (separate reprint).

This species occurred very sparingly in gatherings from Bög and Klosterelv Fiords. It has the antennules short and moderately stout, while the caudal furcæ are somewhat elongated.

Stenhelium hyperborea, sp. n. (Pl. II. figs. 9-13.)

Description of the female.—The specimen represented by the drawing (fig. 9) measures about 1.1 millim.; the body is moderately slender and the rostrum is prominent. The antennules (fig. 10) are eight-jointed; the first four joints are moderately stout, but the others are narrow; the end joint, which is longer than any of the three preceding ones, is about equal in length to the fourth. The proportional

lengths of the various joints are shown approximately by the formula:—

Numbers of the joints..	1	2	3	4	5	6	7	8
Proportional lengths ..	16	.13	.9	.11	.5	.6	.6	.11

The antennæ have the secondary branches three-jointed, the middle joint being very small.

The mouth-organs are somewhat similar in structure to those of *Stenhelia hispida*, G. S. Brady.

In the first pair of thoracic feet (fig. 11) the outer branches, which are composed of three subequal joints, are rather longer than the third joint of the inner branches. The inner branches are comparatively short and do not greatly exceed the length of the outer ones; the first joint is about one and a third times the entire length of the second and third joints. The armature of the first pair is somewhat similar to that of the third pair of *Stenhelia hispida*. The second, third, and fourth pairs resemble the same three pairs of the species just referred to.

The fifth pair are comparatively small; the produced part of the basal joints is subtriangular in outline and furnished with five plumose setæ—three on the inner margin and two on the bluntly pointed apex. The secondary joints, which extend somewhat beyond the basal joints, are subcylindrical and nearly twice as long as broad, and they are each provided with five setæ round the distal end, as shown by the drawing (fig. 12).

The caudal furcæ are very short (fig. 13).

Hab. Bög Fiord and Klosterelv Fiord, rather rare.

The *Stenhelia* just described differs in the structure of the antennules and of the first and fifth thoracic feet from any species of the genus with which I am acquainted.

Genus AMEIRA, Boeck, 1864.

Ameira longipes, Boeck.

1864. *Ameira longipes*, Boeck, Oversigt Norges Copepoder, p. 49.

This, the only species of *Ameira* observed, occurred in gatherings from Bög Fiord, Vadsö, and Varanger Fiord, but appeared to be somewhat rare.

Genus DELAVALIA, G. S. Brady, 1868.

Delavalia robusta, Brady & Robertson.
(Pl. I. fig. 19; Pl. II. figs. 1-3.)

1875. *Delavalia robusta*, Brady & Robertson, Brit. Assoc. Report, p. 196.

A *Delavalia* which appears to be identical with *D. robusta* was not unfrequent in gatherings from Klosterelv, Varanger, and Bög Fiords.

In the first pair of thoracic feet the inner branches, which are two-jointed and rather shorter than the outer branches, have the end joint distinctly shorter than the first one and furnished with three terminal setæ, the middle seta being plumose and rather longer and more spiniform than the one on either side.

The basal joint of the fifth pair bears on its inner aspect one very small and three elongated setæ. The secondary joint, which is subquadrate in outline, is furnished with six setæ; the three outermost and the inner setæ are elongated, but the other two are small, as shown by the drawing (fig. 3, Pl. II.).

The caudal furcæ are slender and nearly as long as the last two abdominal segments. These Arctic specimens are very similar to British specimens of the same species.

Delavalia robusta, var. *finmarchica*, var. n.
(Pl. I. figs. 14-18.)

This form agrees generally with *Delavalia robusta*, but differs in the following particulars:—(1) It is rather larger than the typical form; (2) the antennules (fig. 15) differ slightly in the proportional lengths of the joints; (3) the secondary joints of the fifth thoracic feet are distinctly smaller than those of *D. robusta* (fig. 17), and there is also a slight difference in their armature; but otherwise, however, this variety agrees very closely with the typical form.

Hab. Varanger Fiord, E. Finmark; not common.

Delavalia mimica, T. Scott.

1897. *Delavalia mimica*, T. Scott, Fifteenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 150, pl. i. figs. 1-9.

This species was moderately frequent in gatherings from Bög and Lakse Fiords, Vadsö Sound, and Varanger Fiord.

Delavalia mimica differs so markedly from the typical

species in the structure of the first pair of thoracic feet, that it should perhaps be removed from this genus to some other one.

Genus JONESIELLA, G. S. Brady, 1890.

Jonesiella spinulosa (Brady & Robertson).

1875. *Zosime spinulosa*, B. & R., Brit. Assoc. Rep. p. 196.

1880. *Jonesiella spinulosa*, G. S. Brady, Brit. Copep. vol. ii. p. 41, pl. xlviii. figs. 14-17, pl. xlix. figs. 14, 15.

Jonesiella was moderately frequent in gatherings from Vadsö Sound and Varanger Fiord. The same species has also been recorded from Franz-Josef Land and other parts of the Arctic seas.

Genus CERVINIA, Norman.

Cervinia Bradyi, Norman.

1878. *Cervinia Bradyi*, Norman, Brady's Brit. Copep. vol. i. p. 86, pl. xxiv. A, figs. 3-13.

A single specimen of this rare and somewhat curious species was obtained in Bög Fiord, and was the only one observed in this Finmark collection. *Cervinia Bradyi* was discovered by the Rev. A. M. Norman at Oban in 1876, and has since then been obtained in several places both in England and Scotland; but seldom more than one or two specimens are noticed in any single gathering.

Genus CANTHOCAMPTUS, Westwood, 1836.

Canthocamptus parvus, T. & A. Scott.

1896. ? *Canthocamptus parvus*, T. & A. Scott, Ann. & Mag. Nat. Hist. (6) vol. xviii. p. 6, pl. ii. figs. 14-22.

This small species was obtained in Bög Fjord, but was apparently very rare. *Canthocamptus parvus* has been very sparingly observed near Cape Flora in Franz-Josef Land, as well as in a few places in Scotland.

Genus ATTHEYELLA, Brady, 1840.

Attheyella arctica (Lilljeborg) *.

(Pl. II. figs. 14-19; Pl. III. figs. 1, 2.)

1902. *Canthocamptus arcticus*, Lillj. Kongl. Svenska Vetensk.-Akad. Handl. B. xxxvi. No. 1, p. 37, t. ii. fig. 23, t. iii. figs. 1-4.

* This species was described and figured by me under the name of *Canthocamptus finmarchicus*, and the MS. for the printer had passed out of my hands when, on October 3rd, I received Lilljeborg's paper, and I have much pleasure in substituting his name for the one I had adopted.

Description of the female.—Length about $\cdot 74$ millim. ($\frac{1}{34}$ of an inch). Its general appearance is that of a small *Canthocamptus*. The antennules are moderately short and composed of eight joints; the first four are somewhat dilated, while the four end joints are rather slender; the fourth and fifth joints, which are subequal in length, are shorter than the others (fig. 15).

The antennæ are furnished with short and apparently one-jointed secondary branches.

The various mouth-organs resemble somewhat those of *Attheyella pygmæa* (G. O. Sars).

In the first pair of thoracic feet the inner branches, which are about equal in length to the outer, consist of two joints; the end joint is rather narrower and shorter than the proximal one, and is furnished with a moderately long and slender terminal spine and two setæ, one being very long and slender and one (the innermost) very short; a short spiniform seta also springs from near the end of the inner margin of the proximal joint (fig. 16); both joints have a fringe of minute hairs on the outer margin. The outer branches are moderately stout and composed of three subequal joints; their armature is somewhat similar to that of the outer branches of the first pair in *Attheyella pygmæa*.

The second and third pairs are somewhat similar to each other in structure; the outer branches consist of three and the inner of two joints; the first joint of the inner branches is very short and moderately stout; the second joint is narrower and tapers towards the distal extremity, which reaches to near the end of the second joint of the outer branches; this end joint bears two coarsely-feathered terminal setæ, one being short and spine-like and one very long and slender. In the second pair the second joint of the inner branches appears also to carry one small hair on the lower half of the inner margin (fig. 17), while the same joint of the inner branches of the third pair carries two setæ similarly situated; in this pair the terminal spine is also stouter than the terminal spine of the second pair (fig. 18). The structure of the outer branches is somewhat like that of the outer branches of the first pair, but a small seta springs from near the middle of the inner margin of the third joint; moreover, the terminal spine of the end joint is very long, and a very long and slender seta also springs from the inner distal angle of the same joint. In the fourth pair the inner branches, which are very short and scarcely reach to the end of the first joint of the outer branches, have the proximal joint extremely small, while the end joint, which is the longer of the

two, appears to be furnished with four terminal setæ, as shown by the drawing (fig. 1, Pl. III.); the outer three-jointed branches are also moderately stout.

In the fifth pair the inner produced part of the basal joint is moderately broad and has the abruptly and somewhat irregularly rounded apex provided with six setæ; the three innermost setæ are considerably elongated, the next two are moderately short, while the outermost is very small; the space between the two middle setæ is rather greater than that between the others, so that the setæ appear as if they were arranged into two groups with three setæ in each; the secondary joints, which extend slightly beyond the inner produced portion of the basal joints, are broadly ovate, the breadth being equal to about three fourths of the length, and they are furnished with five setæ round the outer distal margin and end; the setæ vary in length, but the middle one is the shortest (fig. 2, Pl. III.). The furcal joints are not longer than the last abdominal segment and are somewhat wide apart.

Hab. Pools at Kirkenes, E. Finmark; apparently not very rare.

This species, which I have ascribed to the genus *Attheyella*, while differing from any that are known to me, seems to combine the characters of several: one of its nearest allies appears to be the *Canthocamptus rheticus* of Schmeil* (= *Attheyella MacAndrewæ*, T. & A. Scott) †; but the peculiar structure of the inner branches of the first four pairs of feet and the somewhat different form of the fifth pair are sufficient for its separation from that or any other nearly allied form.

Genus TETRAGONICEPS, G. S. Brady.

Tetragoniceps incertus, T. Scott.

1892. *Tetragoniceps incertus*, T. Scott, Tenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 254, pl. xii. figs. 1-17.

This species was only observed in a gathering from Lakse Fiord, and appeared to be extremely rare; but it is small and of a slender form and easily overlooked.

* "Copepoden d. Rhälikon Gebirges," Abhandl. d. natur. Ges. zu Halle, Bd. xix. p. 23, Taf. ii. (1893).

† Ann. & Mag. Nat. Hist. (6) vol. xv. p. 457, pl. xvi. figs. 1-6 (1895).

Genus LAOPHONTE, Philippi.

Laophonte horrida, Norman.

1876. *Laophonte horrida*, Norman, "Report 'Valorous' Exped.," Proc. Roy. Soc. vol. xxv. p. 206.

Several specimens of this well-marked species were obtained in gatherings from Lakse Fiord and Varanger Fiord. The species was recorded from the Arctic seas by Buchholz in his Report on the North German Expedition, 1869-70, under the name of *Cyclops minuticornis*, O. F. Müller; and it was also collected by Mr. W. S. Bruce in Franz-Josef Land, as well as near Bear and Hope Islands, Spitzbergen.

Laophonte inopinata, T. Scott.

1892. *Laophonte inopinata*, T. Scott, Tenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 256, pl. xi. figs. 1-11.

The only gathering in which this species was observed was collected between tide-marks at Vadsö, and it was apparently very rare.

Laophonte depressa, T. Scott.

1894. *Laophonte depressa*, T. Scott, Twelfth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 245, pl. vi. figs. 24-31, pl. vii. figs. 1-3.

This, like *Laophonte inopinata*, was found only in one gathering, viz., that from Bög Fiord, and it appeared also to be very rare. This species was also collected by W. S. Bruce at Franz-Josef Land in 1896-97.

Laophonte perplexa, T. Scott.

1899. *Laophonte perplexa*, T. Scott, "Crust. from Franz-Josef Land," Journ. Linn. Soc., Zool. vol. xxvii. p. 98, pl. v. fig. 14, pl. vi. figs. 7-11.

This species occurred with moderate frequency in gatherings from Bög Fiord, Vadsö Sound, and Varanger Fiord.

Laophonte thoracica, Boeck.

1863. *Laophonte thoracica*, Boeck, Oversigt Norges Copepoder, p. 54.

One or two specimens which I ascribe to this species were obtained in a gathering from Bög Fiord, but it was observed in none of the other gatherings.

Genus ANCORABOLUS, Norman.

Ancorabulus mirabilis, Norman.

A few specimens of this remarkable species were obtained
Ann. & Mag. N. Hist. Ser. 7. Vol. xi. 2

in a gathering from Varanger Fiord. *Ancorabolus mirabilis* was observed many years ago by the Rev. A. M. Norman along with one or two other curious forms in a gathering of Clyde Crustacea; drawings of these forms were prepared, and these, with suitable descriptions, would have been published ere this time, but the stress of other work has delayed this being done; it is expected, however, that these descriptions and drawings will now soon be ready for publication. The occurrence of this strange form in the Arctic seas as well as in the Firth of Clyde suggests that its distribution may be more general and diffused than has been observed hitherto. The extremely spiny armature of the carapace tends to collect around the animal a coating of mud, which helps to conceal it and prevent its recognition.

Genus CLETODES, Brady, 1872.

Cletodes hirsutipes, T. Scott.

1897. *Cletodes hirsutipes*, T. Scott, Fifteenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 171, pl. vii. figs. 11-18.

This species occurred very sparingly in gatherings from Vadsö and Varanger Fiord.

Cletodes curvirostris, T. Scott.

1894. *Cletodes curvirostris*, T. Scott, Twelfth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 250, pl. viii. figs. 18-24.

A single specimen of *Cletodes curvirostris* was observed along with the species just recorded in the gathering from Varanger Fiord, and this was the only gathering in which it was noticed.

Cletodes varians, T. Scott, sp. n. (Pl. III. figs. 7-11.)

Description of the female.—The body is narrow and cylindrical in form; the first two segments of the abdomen appear to be coalescent and the last is armed with a small dorsal tooth (fig. 7); the rostrum is small; the caudal furcæ are moderately elongated and about equal to the combined lengths of the last two abdominal segments. The specimen represented by the drawing measures about $\cdot 6$ millim. ($\frac{1}{40}$ of an inch) in length.

The antennules are short and composed of five joints; four of the joints are of moderate size, but the penultimate one is small; the last three joints are provided with a few somewhat stout and coarsely plumose and plain setæ (fig. 8).

The antennæ and mouth-organs are similar to those of *Cletodes tenuipes*, T. Scott.

The first pair of thoracic feet have the outer branches moderately elongated and three-jointed, but the inner branches appear to be rudimentary; they each consist of a minute rounded process, which may be articulated to the basal joint, but, if so, the articulation is indistinct; a single short seta is the only armature observed on these rudimentary branches (fig. 9). In the second, third, and fourth pairs the outer branches, which are three-jointed, are somewhat similar to the outer branches of the first pair, but are rather more elongated; the inner branches are apparently entirely obsolete.

The fifth pair, which somewhat resembles the fifth pair of *Cletodes tenuipes*, has the basal joint small, slightly produced anteriorly, and furnished with two apical setæ; the secondary joint is narrow and elongated, being about six times longer than broad, and bears one seta near the middle of the outer margin and other four near the distal end and apex, as shown by the drawing (fig. 10).

The male has a general resemblance to the female, but the antennules are modified for grasping, and the fifth pair of thoracic feet are extremely small (fig. 11).

Hab. Bög Fiord; rare.

This species is in some respects similar to the form to be next described, but differs in having the inner branches of the first four pairs of thoracic feet rudimentary or wanting.

Cletodes tenuipes, T. Scott, var.
(Pl. II. fig. 20; Pl. III. figs. 3-6.)

1897. *Cletodes tenuipes*, T. Scott, Fifteenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 170, pl. i. figs. 19-27.

This species, which is comparatively small, was obtained in the same gathering with the last. The length of the specimen represented by the drawing (fig. 3, Pl. III.) is only about .56 millim. (scarcely $\frac{1}{45}$ of an inch). The species was first described from Clyde specimens, but has since been obtained on other parts of the Scottish coasts. In these East Finmark specimens one or two apparently slight differences are noticed. They have usually, for example, a straight outline, whereas the specimens from the Scottish seas, when seen from the side, are almost invariably incurved; the inner branches of the second, third, and fourth pairs of thoracic feet appear also to be rather smaller (fig. 5, Pl. III.), and

the secondary branches of the fifth pair are narrow and sub-cylindrical (fig. 6, Pl. III.).

The antennules (fig. 20, Pl. II.), which resemble very closely those of *C. varians*, are short and moderately stout, and composed of five joints, the penultimate joint being very small, and they are also sparingly setiferous. The antennæ and mouth-organs are apparently similar in structure to the same appendages in Scottish specimens of *Cletodes tenuipes*; so also are the first pair of thoracic feet (fig. 4, Pl. III.). In the next three pairs the inner branches, as already remarked, are rather smaller, and the secondary branches of the fifth pair are also slightly different; but these differences do not appear to be of sufficient importance to be of specific value.

Cletodes perplexa, T. Scott.

1899. *Cletodes perplexa*, T. Scott, Seventeenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 257, pl. xi. figs. 12-20, pl. xii. fig. 1.

This curious species occurred very sparingly in a gathering from Bög Fiord, the only one in which it was observed. *C. perplexa*, which has not till now been recorded out of Scotland, is readily distinguished by the form of the fifth thoracic feet, and that even without dissection.

Cletodes lata, T. Scott.

1892. *Cletodes lata*, T. Scott, Tenth Ann. Rep. Fishery Board for Scotland, pt. iii. p. 257, pl. x. figs. 10-18.

The gathering in which this species was obtained was collected in Klosterelv Fiord. I find no previous record of this *Cletodes* from the Arctic seas. In general appearance it is not unlike *Cletodes similis*, but it differs from that species in some details of structure, and especially in the form of the fifth thoracic feet in the female.

* *Cletodes similis*, T. Scott.

1895. *Cletodes similis*, T. Scott, Thirteenth Ann. Rep. Fishery Board for Scotland, pt. iii. pl. iii. figs. 22-26, pl. iv. figs. 1-3.

This species was observed in a gathering from Svolvær, Lofoten Islands, the only gathering in which it was noticed. It is one of the species collected by Mr. Bruce at Franz-Josef Land and also to the eastward of Spitzbergen. Only one or two specimens occurred in the Svolvær gathering.

Genus PLATYCHELIPUS, G. S. Brady, 1880.

Platychelipus littoralis, G. S. Brady.

1880. *Platychelipus littoralis*, G. S. Brady, Brit. Copep. vol. ii. p. 103, pl. lxxix. figs. 20-23, pl. lxxx. fig. 15.

The only gathering in which this species occurred was from Bög Fiord, and very few specimens were observed. *Platychelipus* was collected by W. S. Bruce, along with *Nannopus palustris*, G. S. Brady, on the east side of Kolguev Island, while cruising in Mr. Coates's yacht the 'Blencathra.'

Genus DACTYLOPUS, Claus, 1863.

Dactylopus tisboides, Claus.

1863. *Dactylopus tisboides*, Claus, Die frei lebenden Copepoden, p. 127, pl. xvi. figs. 24-28.

This species was of frequent occurrence in gatherings from Bög Fiord, Lakse Fiord, Vadsö, between tide-marks, Vanger Fiord, East Finmark; and also from Svolvær, Lofoten Islands. There appeared to be two forms, and the one which was the more common of the two had pellucid markings along the outer margins both of the secondary joint and of the inner produced part of the basal joint of the fifth pair of thoracic feet; similar to specimens of the same species collected by Mr. Bruce at Franz-Josef Land (Journ. Linn. Soc., Zool. vol. xxvii. p. 104, 1899).

Dactylopus longirostris, Claus.

1863. *Dactylopus longirostris*, Claus, *op. cit.* p. 127, pl. xvii. figs. 4-6.

A few specimens apparently belonging to this species occurred in gatherings from Bög Fiord and Vadsö Sound. One or two specimens were observed in the gathering from Vadsö, which, though differing from the typical *D. longirostris*, resemble that species very closely in their general structure, and I propose to describe them under the following varietal name:—

Dactylopus longirostris, Claus, var. *finmarchicus*.
(Pl. II. figs. 4-8.)

The specimen represented by the drawing (fig. 4) measures about .8 millim. long. The rostrum is prominent. The antennules are slender and elongated and composed of eight joints; the first, second, fourth, and last are subequal in length and considerably longer than the others, while the fifth

is very small (fig. 5). The antennæ and mouth-organs are similar to those of *D. longirostris*.

The first pair of thoracic feet (fig. 6) are moderately stout; the outer branches, which are composed of three nearly equal joints, are about as long as the first joint of the inner branches, the spines on the outer margins are elongated and slender, and the second joint bears a plumose seta on the inner distal angle; the length of the first joint of the inner branches is equal to about twice the length of the second and third combined, but the second joint is very small; the armature of the inner branches is similar to that of the same branches in typical specimens of *D. longirostris*. The next three pairs of thoracic feet are somewhat similar to those of the typical form, but the fifth pair seems to differ in one or two particulars; the inner produced part of the basal joint in this pair is broadly subcylindrical and the obliquely truncated apex is furnished with five plumose setæ; the two outermost setæ spring from the outer angle and are close together, but the others are more widely apart; the secondary joint is broadly ovate and extends somewhat beyond the end of the basal joint; the armature of this joint consists of the same number of setæ as on the secondary joint of the same pair in *D. longirostris* (fig. 7). The furcal joints (fig. 8) are very short.

Hab. Vadsö Sound; rare.

It will be observed that this form, while agreeing generally with the typical *D. longirostris*, Claus, has the first pair of thoracic feet proportionally stouter and shorter, and the outer branches are about as long as the first joint of the inner ones, and the fifth pair are more broadly foliaceous; but though these differences are fairly well marked, they can scarcely be considered of specific value.

Dactylopus tenuiremis, Brady & Robertson.

1875. *Dactylopus tenuiremis*, Brady & Robertson, Brit. Assoc. Report, p. 197.

This species occurred very sparingly in gatherings from Bög Fiord, Lakse Fiord, and Vadsö Sound. It has also been collected in the Arctic seas by Mr. Bruce.

(?) *Dactylopus brevicornis*, Claus.

1866. *Dactylopus brevicornis*, Claus, Die frei lebenden Copepoden von Nizza, p. 29, t. iii. figs. 20-25.

One or two specimens apparently belonging to this small species were collected in Bög Fiord and Vadsö Sound.

Dactylopus Strömii (Baird), var. *arcticus*, T. Scott.
(Pl. IV. figs. 1-7.)

1899. *Dactylopus Strömii* (Baird), var. *arcticus*, T. Scott, "Crust. from Franz-Josef Land," Journ. Linn. Soc., Zool. vol. xxvii. p. 106, pl. v. figs. 11-17.

Several female specimens of this variety were obtained in gatherings from Bög Fiord and Vadsö Sound. In this variety the antennules are nine-jointed; the posterior foot-jaws appear to be more hirsute than in the typical form, and the first and fifth thoracic feet are somewhat similar to the same appendages in *D. similis*, Claus.

One or two male specimens apparently belonging to the same variety were also obtained in the gathering from Bög Fiord, and as no special mention was made to the male form in the original description of the variety in my "Report on the Franz-Josef Land Crustacea" referred to above, I will here glance briefly at a few of the more important characters by which it is distinguished from the female. It differs from the female in having the antennules modified as shown in the drawing (fig. 2). The second pair of thoracic feet have the inner branches apparently two-jointed; the first joint is very short, but the second is elongated and narrow except at the base, where it is dilated on the outer aspect; this joint, which reaches to near the end of the outer branches, bears on the dilated basal part a stout spine-like appendage that reaches to the end of the joint, as shown in the drawing (fig. 5), while the end of the joint itself terminates in what looks like a recurved bifid process, which has one branch of the fork elongated and slender, extending to near the base of the joint, but the other branch is short; the spines on the outer distal angles of the joints of the outer branches of the second pair of feet are also moderately stout—proportionally more so than in the female.

The fifth feet (fig. 6) are small; the inner part of the basal joint, which is only slightly produced and rounded, is armed with three small spines; the secondary joint is broadly ovate and is furnished with a few marginal and terminal setæ, as shown by the figure.

The specimen represented by the drawing (fig. 1) measured about a millimetre in length.

Genus *THALESTRIS*, Claus, 1863.

Thalestris helgolandica, Claus.

1863. *Thalestris helgolandica*, Claus, Die frei lebenden Copepoden, p. 131, t. xvii. figs. 12-21.

A number of specimens of this *Thalestris* were obtained in gatherings from Bög Fiord, East Finmark, and Svolveær, Lofoten Islands.

Thalestris polaris, T. Scott.

1899. *Thalestris polaris*, T. Scott, "Crust. from Franz-Josef Land," Journ. Linn. Soc., Zool. vol. xxvii. p. 106, pl. vii. figs. 8-16.

This species occurred in gatherings from Bög Fiord, Lakse Fiord, Vadsö, between tide-marks, and Varanger Fiord.

Thalestris Jacksoni, T. Scott.

1899. *Thalestris Jacksoni*, T. Scott, *op. cit.* p. 109, pl. viii. figs. 3-9.

A single specimen of this fine species was obtained in a gathering collected between tide-marks at Vadsö. This species attains to at least one tenth of an inch in length.

Thalestris Clausii, Norman.

1868. *Thalestris Clausii*, Norman, Brit. Assoc. Report, p. 297.

A single female specimen was observed in the Finmark collection; it occurred in a gathering from Lakse Fiord.

The fifth pair of feet in this specimen are foliaceous; the basal joint is subtriangular, with a somewhat broadly but irregularly rounded apex, which reaches to about the end of the secondary joint and is furnished with six moderately short and plumose setæ round the lower inner margin and end, but the first seta, counting from the inner margin, is rather shorter and more coarsely plumose, and the space between it and the next seta is greater than that between any of the others; moreover, the fourth seta, still counting from the inside, is rather more slender than the other five; the secondary joint is broadly ovate, the breadth being equal to about two thirds of the length; this joint is furnished with six setæ on the lower outer margin and apex; the basal part of each of the three uppermost setæ on the outer margin and the innermost apical seta is comparatively stout, but they become very slender towards the end; the remaining two setæ, which are near the apex and are closer to each other at the base than they are to those on either side, are rather longer and more slender than the other four. Both the inner and the outer margins of the secondary joint are ciliated. Prof. G. S. Brady, in his 'Monograph of the British Copepoda,' states that this is perhaps the most common of

the British species belonging to the genus *Thalestris*; but there does not seem to be much known respecting its distribution outside the British area.

Thalestris longimana, Claus. (Pl. IV. figs. 8-13.)

1863. *Thalestris longimana*, Claus, Die frei lebenden Copepoden, p. 130, t. xviii. figs. 1-11.

A single specimen of *Thalestris longimana* was obtained in the Varanger Fiord gathering. The dissections represented by the drawings have been carefully compared with similar dissections of Scottish specimens, and the only important difference observed was in the basal and secondary joints of the fifth pair of thoracic feet. In the specimen from Varanger Fiord the basal and secondary joints of the fifth pair (fig. 12) are not so broadly foliaceous, both branches being of a more cylindrical form; but this difference may be only accidental or due, perhaps, to the specimen being scarcely mature. The antennules (fig. 9) and the second maxillipeds (fig. 10) are identical with the same appendages in Scottish specimens. In the second maxillipeds the inner concave part of the hand has the same minutely tuberculated surface peculiar to that species; the general form of the hand is also exactly similar. *Th. longimana*, which was first recorded by Prof. Claus from Heligoland, has a distribution apparently coextensive with the British Islands; it was recorded by the Rev. A. M. Norman in 1869 from Bressay, Shetland*, and from various other places around our shores by Prof. G. S. Brady† and others. Its occurrence in the gathering from Varanger Fiord extends its distribution to the Arctic seas.

Thalestris Normani, sp. n. (Pl. III. figs. 12-18.)

This *Thalestris* closely resembles *Thalestris frigida*, T. Scott, in its general appearance and size, but differs from that species in several details of structure. The following is a brief description of the species:—

(1) *The female*.—The antennules of the female are composed of nine joints; the first four, which gradually decrease in length, are together about twice the length of the remaining five joints; the fifth, seventh, and eighth joints are smaller than any of the others (fig. 13).

* "Last Report on Dredging among the Shetland Isles," Brit. Assoc. Report for 1868 (published 1869), p. 297.

† Brit. Copep. vol. ii. p. 136 (1880).

The antennæ are furnished with three-jointed secondary branches.

The second maxillipeds and other mouth-organs are somewhat similar to those of *Thalestris frigida*.

The first pair of thoracic feet are moderately short and stout and the outer branches are distinctly shorter than the inner ones (fig. 14); the spiniform seta on the outer distal angle of the second basal joint is comparatively large, but the spine on the inner distal angle is considerably smaller; the terminal claw of the inner branches is very long and slender and the plumose seta which springs from near the middle of the inner margin of the second joint is also elongated; the general structure and armature of both branches resemble those of the first pair in *Thalestris robusta*, Claus, while the second, third, and fourth pairs are somewhat similar to those of *Thalestris frigida*.

The fifth pair (fig. 15) have also a general resemblance to the fifth pair of that species, but the basal joint is proportionally rather broader at the base, and its armature is somewhat differently arranged; the arrangement of the armature of the secondary joint is also somewhat different from that of the secondary joints of the species referred to.

The caudal furcæ are very short.

(2) *The male*.—The male resembles the female, but is rather smaller. The antennules have a modified structure to fit them for grasping. The spine on the inner distal angle of the second basal joints of the first pair of thoracic feet is strong and distinctly hooked at the end, as shown in Pl. III. fig. 14 a.

The inner branches of the second pair of feet resemble generally the same branches in the male of *Thalestris frigida*, but they are distinctly broader in proportion to their length, and there is a slight difference in their armature, as shown in the drawing (fig. 16).

The fifth pair also resemble somewhat those of the male of the species referred to, especially in their armature, but the inner produced part of the basal joint is less prominent and more broadly rounded and the secondary joint is rather smaller (fig. 17).

Hab. Bög Fiord; not very common.

This *Thalestris* comes very near *Th. frigida*, and I was at first inclined to regard it as belonging to that species; but it was found that the difference in the structure of the first pair of thoracic feet in both the male and female and of the inner branches of the second pair in the male was alone sufficient to distinguish it from the species referred to. The structure of

the first pair is in some respects not unlike that of *Th. robusta*, Claus, from Nice and Messina †, but the fifth pair in form and armature is decidedly different. It may be further remarked that the structure of the first pair of feet in both of the species named exhibits a close resemblance to that of the first pair in certain species of *Dactylopus*, so that the species may be almost considered a connecting-link between the two genera *Thalestris* and *Dactylopus*.

Genus PSEUDOTHALESTRIS, G. S. Brady, 1883.

Pseudothalestris major (T. & A. Scott).

1895. *Pseudowestwoodia major*, T. & A. Scott, Ann. & Mag. Nat. Hist. (6) vol. xv. p. 56, pl. vi. figs. 17-30.

This small species was moderately frequent in a gathering collected between tide-marks at Vadsö; but it was not observed in any of the other Finmark gatherings.

Four British species of *Pseudothalestris* have been described—the first in 1894 in the Twelfth Ann. Report of the Fishery Board for Scotland, pt. iii. p. 257, pl. xi. figs. 21-29, under the name of *Pseudowestwoodia Andrewi*, T. Scott: descriptions of other two species by T. & A. Scott were published in the Ann. & Mag. Nat. Hist. for January 1895 under the names of *Pseudowestwoodia pygmæa* and *major*; in the 'Annals' for the following month of June (p. 463) these authors withdrew the name *Pseudowestwoodia*, T. Scott, in favour of *Pseudothalestris*, G. S. Brady, as it was found that the two genera were identical and that the latter name had been published several years before the other. The description of the fourth species by Prof. G. S. Brady was published early in 1901 in Nat. Hist. Trans. N. D. & N. C. vol. xiv. p. 59, pl. iii. figs. 11-16, under the name of *Pseudothalestris monensis*, from specimens obtained at Port Erin, Isle of Man. *Pseudothalestris major* has not previously been recorded from the Arctic seas.

Genus WESTWOODIA, Dana.

* *Westwoodia nobilis* (Baird).

1845. *Arpacticus nobilis*, Baird, Trans. Berw. Nat. Club, vol. ii. p. 155.

This pretty little species resembles very closely the British species of *Pseudothalestris*, but differs distinctly in the structure of the first pair of thoracic feet. It was of rare

† Die frei lebenden Copepoden, p. 129, t. xviii. figs. 17-23, t. xix. fig. 1.

occurrence in the present collection; the only gathering in which the species was observed was from Svolveær, Lofoten Islands, and only one or two specimens were noticed.

Genus HARPACTICUS, H. M.-Edw., 1838.

Harpacticus chelifera (O. F. Müller), var. *arcticus*, Poppe.

1884. *Harpacticus chelifera*, var. *arcticus*, Poppe, "Stillen Ocean u. Behrings Meer freileb. Copep." Arch. f. Naturgesch. 50 Jahrg. i. Bd. p. 296, t. xxiii. figs. 1, 2, 4-7, t. xxiv. figs. 1-7, 9, 10.

This Harpacticid was obtained in gatherings from Bög Fiord, Lakse Fiord, Vadsö, and Varanger Fiord, E. Finmark; and from Svolveær, Lofoten Islands. Most of the specimens appeared to belong to the variety *arcticus*, Poppe.

Genus ZAUS, Goodsir, 1845.

Zaus aurelii, Poppe.

1884. *Zaus aurelii*, Poppe, *op. cit.* p. 286, t. xx. figs. 7-9, t. xxi. figs. 5-15.

A good number of specimens of *Zaus*, all of which were apparently referable to *Z. aurelii*, were obtained in gatherings from Bög Fiord, Lakse Fiord, Vadsö, and Svolveær.

Genus IDYA, Philippi, 1843.

Idya furcata (Baird).

1837. *Cyclops furcata*, Baird, Mag. Zool. & Bot. vol. i. p. 330, t. ix. figs. 26-28.

Idya was moderately common in Bög Fiord and Lakse Fiord and sparingly in one or two other gatherings. Though the specimens were all more or less carefully examined, there appeared to be only the one species represented.

Fam. Lichomolgidæ.

Genus HERRMANELLA, Canu, 1891.

? *Herrmanella finmarchica*, sp. n.
(Pl. IV. figs. 14-19.)

The form described under this name was collected in Bög Fiord; there were very few specimens in the gathering, and they were all more or less damaged.

The specimen represented by the drawing (fig. 14)

measured about 1.3 millim. ($\frac{1}{8}$ of an inch) in length and had a general resemblance to *Lichomolgus*.

The antennules, which were imperfect, are moderately short and composed of six (or seven) joints, but only five were present (fig. 15); the third joint is small, but the others are of moderate length.

The mandibles and maxillæ were not observed.

Both pairs of maxillipeds are small; the end joints of the first maxillipeds are furnished on the upper aspect with two moderately long setæ and a few minute spines; one seta springs from near the base of the joint, but the other is subterminal; both setæ appear to be ciliated along one side, as shown by the drawing (fig. 17). The second pair of maxillipeds have the end joints armed with a small but stout terminal claw, in addition to one or two small spines (fig. 18).

All the four pairs of swimming-feet are moderately short and stout and have both branches three-jointed and of nearly equal length.

In the first pair the first and second joints of the outer branches are each furnished with a stout spine on the outer margins, and there is also a seta on the inner margin of the second joint, but not on the first; the end joint bears four spines on the outer margin and apex and four setæ on the inner margin. The first two joints of the inner branches have each a seta on the inside margin, while externally their distal angles form each a small tooth-like process; the end joint of the inner branches is armed with a stout subterminal spine on its outer aspect and with five setæ on its inner margin (fig. 19); all the setæ appear to be plumose.

The other three pairs are somewhat similar to the first, but differ to some extent in the armature chiefly of the end joints. In the second pair the only apparent difference is that the end joints of the outer branches are furnished interiorly with five instead of four setæ, while the end joints of the inner branches are each furnished with three spines on the outer and three setæ on the inner margin. The armature of the third pair appears to be similar to that of the second. In the fourth pair the second joint of the outer branches bears two setæ on the inner margin, while the end joint is armed with three spines and three setæ; the only difference observed in the armature of the inner branches is in the end joints being provided with three slender spines and two setæ.

The fifth pair are small and apparently only one-jointed (fig. 14).

The genital segment, which is composed of two coalesced

segments, is moderately dilated and rather more than half the entire length of the abdomen.

The caudal furcæ are slender and elongated, their length being somewhat greater than that of the last two abdominal segments combined.

Hab. Bög Fiord; apparently rare.

The species is provisionally ascribed to the genus *Herrmannella* of Canu*; the second maxillipeds are, however, more feebly clawed than those of any of the species already described, and because of this and one or two other differences this East Finmark form should, perhaps, be placed in another genus; but it will be necessary to have more perfect specimens ere its position can be satisfactorily determined.

EXPLANATION OF THE PLATES.

PLATE I.

Cyclopina Schneideri, sp. n.

- Fig.* 1. Female, dorsal view, $\times 53$. 2. One of the antennules, $\times 144$.
3. One of the antennæ, $\times 120$. 4. Mandible and palp, $\times 216$.
5. Foot of first pair, $\times 144$. 6. Foot of fifth pair, $\times 180$.

Ectinosoma finmarchicum, sp. n.

- Fig.* 7. Female, seen from the side, $\times 53$. 8. (?) Male, seen from the side, $\times 53$. 9. One of the female antennules, $\times 270$. 10. One of the male antennules, $\times 180$. 11. One of the antennæ, $\times 180$.
12. Foot of fifth pair, male, $\times 270$. 13. Foot of fifth pair, female, $\times 180$.

Delavalia robusta, Brady & Robertson, var. *finmarchica*, nov.

- Fig.* 14. Female, seen from the side, $\times 53$. 15. One of the antennules, $\times 180$. 16. Foot of first pair, $\times 180$. 17. Foot of fifth pair, $\times 240$. 18. Part of abdomen and caudal furca, $\times 105$.

Delavalia robusta, Brady & Robertson.

- Fig.* 19. Part of abdomen and caudal furca, enlarged.

PLATE II.

Delavalia robusta, Brady & Robertson.

- Fig.* 1. One of the antennules, $\times 180$. 2. Foot of first pair, $\times 180$.
3. Foot of fifth pair, $\times 240$.

* "Les Copépodes marins du Boulonnais," Bull. Scientifique de la France et de la Belgique, p. 480 (1891).

Dactylopus longirostris, Claus, var. *finmarchicus*, nov.

Fig. 4. Female, seen from the side, $\times 53$. 5. One of the antennules, $\times 180$. 6. Foot of first pair, $\times 135$. 7. Foot of fifth pair, $\times 180$. 8. Part of abdomen and caudal furca, enlarged.

Stenhelia hyperborea, sp. n.

Fig. 9. Female, seen from the side, $\times 39$. 10. One of the antennules, $\times 180$. 11. Foot of first pair, $\times 135$. 12. Foot of fifth pair, $\times 180$. 13. Part of abdomen and caudal furca, enlarged.

Attheyella arctica, Lilljeborg.

Fig. 14. Female, seen from the side, $\times 37$. 15. One of the antennules, $\times 270$. 16. Foot of first pair, $\times 240$. 17. Foot of second pair (inner and part of outer branches), $\times 240$. 18. Foot of third pair (inner and part of outer branches), $\times 240$. 19. Part of abdomen and caudal furca, enlarged.

Cletodes tenuipes, T. Scott, var.

Fig. 20. Antennule, female, $\times 540$.

PLATE III.

Attheyella arctica, Lilljeborg.

Fig. 1. Foot of fourth pair, $\times 140$. 2. Foot of fifth pair, $\times 140$.

Cletodes tenuipes, T. Scott, var.

Fig. 3. Female, dorsal view, $\times 79$. 4. Foot of first pair, $\times 540$. 5. Foot of fourth pair, $\times 360$. 6. Foot of fifth pair, $\times 360$.

Cletodes varians, sp. n.

Fig. 7. Female, seen from the side, $\times 106$. 8. One of the antennules, $\times 432$. 9. Foot of first pair, $\times 270$. 10. Foot of fifth pair (female), $\times 270$. 11. Foot of fifth pair (male), $\times 540$.

Thalestris Normani, sp. n.

Fig. 12. Female, seen from the side, $\times 40$. 13. One of the antennules, $\times 180$. 14. Foot of first pair, $\times 135$. 14 a. Spine on inner distal angle of second basal joint of first pair (male), $\times 135$. 15. Foot of fifth pair (female), $\times 135$. 16. Inner branch of second foot (male), $\times 135$. 17. Foot of fifth pair (male), $\times 180$. 18. Part of abdomen and caudal furca, enlarged.

PLATE IV.

Dactylopus Strömii (Baird), var. *arcticus*, T. Scott (male).

Fig. 1. Male, seen from the side, $\times 53$. 2. One of the male antennules, $\times 180$. 3. One of the second maxillipeds, $\times 270$. 4. Foot of first pair, $\times 105$. 5. Foot of second pair, $\times 180$. 6. Foot of fifth pair, $\times 180$. 7. Part of abdomen and caudal furca, enlarged.

Thalestris longimanus, Claus.

Fig. 8. Female, seen from the side, $\times 40$. 9. One of the antennules, $\times 135$. 10. One of the second maxillipeds, $\times 105$. 11. Foot of first pair, $\times 105$. 12. Foot of fifth pair, $\times 158$. 13. Part of abdomen and caudal furca, enlarged.

(?) *Herrmanella finmarchica*, sp. n.

Fig. 14. Female, dorsal view, $\times 40$. 15. One of the antennules (imperfect), $\times 108$. 16. One of the antennæ (imperfect), $\times 108$. 17. One of the first maxillipeds, $\times 220$. 18. One of the second maxillipeds, $\times 146$. 19. Foot of first pair, $\times 154$.

II.—*A Revision of the Genera of the ARANEÆ or Spiders, with Reference to their Type Species.* By F. PICKARD-CAMBRIDGE, B.A., F.Z.S.

THE following notes contain the conclusions which have been reached as to the species which, on consistent principles of settlement, ought to be regarded as the types of the various genera dealt with.

The genera include those published by Menge in Preuss. Spinn. 1866-78, by J. H. Emerton in Trans. Conn. Acad. vol. vi. 1882, by Friedk. Dahl in Schrift. Naturwiss. Schleswig-Holstein, Bd. vi. 1886, and in Sitz.-Bericht Gesell. nat. Freunde, Berlin, 1901, and by Embr. Strand in Archiv Mathem. Natur. B. xxiv. NR. 2, Kristiania, 1901.

I also take this opportunity to correct some slips in my former papers and errors occasioned by oversights, or new facts, in connexion with the various steps referred to in the process of ascertaining the types.

As regards Menge's genera: whenever he definitely cites a Tab. referring to a single species under the new generic name and before the diagnosis, I regard the species thus referred to as specially characteristic of the genus, and therefore as the type; though I have in most cases below traced out the history of the other species involved, for the sake of reference in case of future disputation.

In quoting the name *Walckenaera*, auct., it is here spelt as it was originally by Blackwall, *Walckenaeria*, and the former is regarded as a misquotation of the latter.

Ann. & Mag. Nat. Hist. ser. 7, vol. xi. (Jan. 1902), p. 9.

Line 1.—*Argus*, a nom. præocc. by Bohadsch, Anim. Marin. p. 65, Moll. Gastr. 1761.







