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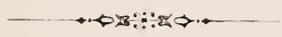
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CRUSTACEA COPEPODA. II. COPEPODA PARASITA AND HEMIPARASITA.

BY

(Hans Jacob)
H. J. HANSEN.

WITH 5 PLATES, A CHART, AND A LIST OF THE STATIONS.



COPENHAGEN.
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1923.

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Crustacea Copepoda. II.

By

H. J. Hansen.

Copepoda Parasita.

Introduction.

Before entering on the subject of the present paper I may refer to "Introductory Remarks" in "Crustacea Malacostraca I" published in 1908, because they contain various statements that need not to be repeated here. In that chapter I explained the limits of the area investigated by the "Ingolf" and other Danish expeditions to our northern dependencies; the principal sources (apart from the "Ingolf") for the material examined were enumerated, and the principles followed as to "occurrence" and "distribution" were laid down. Zoologists wishing to get some information on these and allied topics may find them in the paper mentioned.

The present paper comprises not only the Copepoda parasites on fishes, Crustacea Malacostraca, and Annelida, but also the typical semi-parasites, viz. the family Asterocheridæ sens. Giesbrecht, and besides all forms living as commensals or parasites within Ascidiæ; furthermore the Monstrilloida, which are endoparasites excepting as adults, are included, while such pelagic Copepoda which are only surmised to be semi-parasites (as *Corycæus*, *Oncæa*, etc.) are omitted.

Our earlier knowledge of the parasites on fishes, Annelida and malacostracous Crustacea living near Greenland was rather good, but as to semi-parasites and commensals it was extremely poor. In his "Conspectus" (1913) K. Stephensen put together all what was known; he enumerates as "Copepoda marina parasitica" 40 species. Two of these must be cancelled as synonyms, and a third form (*Canthocamptus? Hippolytes* Kr.) is certainly neither parasite nor commensal; thus we get in all 37 species, one of which belongs to the Notodelphyoida, while 36 are real parasites; later on Stephensen has added a species of *Monstrilla*. From the seas at Iceland and the Færoes a low number of parasites on fishes was known, and 3 among them were unknown from Greenland. The result is that about 41 species of parasites, semi-parasites and commensals were known from the "Ingolf" area.

In the present paper 101 species are enumerated, all, excepting 3 not seen by me, preserved in the Copenhagen Museum; 29 species are established as new to science. The "Ingolf" has gathered 43 species,

16 of which are new. Among the 101 species 48 are parasites on fishes and only 19 among these have been taken by the "Ingolf"; only 6 of these 48 parasites are new, and 4 among them were found on deep-sea fishes taken by the "Ingolf". During many years Krøyer, Steenstrup and Lütken had taken much interest in procuring and collecting parasitic Copepoda from fishes, and the fauna of these animals inhabiting fishes living generally in depths from near the shore and down to about a hundred fathoms at West-Greenland was very well known, owing to the commonly used papers published by these three Zoologists. As to parasites on Annelida only 2 species could be added to G. M. R. Levensen's paper (1877). In my monograph of the Choniostomatidæ (1897) 8 species of these parasites living on various Malacostraca were described; in the present paper 18 species of that family are mentioned as taken in the "Ingolf" area, and 8 among them are new; it may be supposed that some few species living in the marsupium of Amphipoda may still be discovered by K. Stephensen who has begun to work out the rich material of this large order.

When we proceed to the Asterocheridæ and the forms living within Ascidiæ the results are quite different. Of Asterocheridæ not a single species was known from the "Ingolf" area; in the present paper 17 species are enumerated, together with 1 species of the Lichomolgidæ; 11 among them are new, and 11 were found in sifted samples of bottom material secured by the "Ingolf"; several were taken in considerable to great depths. Of Copepoda living within Ascidiæ only 1 species (wrongly determined) was known from the "Ingolf" area; in this paper 9 species are mentioned, 5 among them taken by the "Ingolf", 4 among them new, and one species is of peculiar interest, as it belongs to the genus *Cyclopina*, but no species of this well-known type was hitherto known to live as a commensal.

Probably only a very moderate number of fish-parasites living in the "Ingolf" area are still unknown, and most of them will be found on fishes from rather deep to very deep water. Several forms living within Ascidiæ are still to be discovered, and of the Choniostomatidæ many forms may certainly be found, when enormous quantities of Cumacea, Amphipoda and Isopoda from most different depths have been procured and are specially inspected with the intention to discover parasites. A comparison with the Norwegian fauna of Asterocheridæ (sens. Giesbrecht) and Lichomolgidæ gives the result that it must be possible to discover a large number of described and undescribed forms in the "Ingolf" area, when sifted bottom material taken from a hundred of places from near the shore and down to great depths, especially around Greenland, is thoroughly looked over.

On the literature and the arrangement of the Copepoda in the present paper a little may be said. As to the Asterocheridæ, Lichomolgidæ, Notodelphyoida, etc. the splendid treatment of G. O. Sars in Vol. VI and VIII of his "Account" is taken as guide; I cannot follow him in dividing for instance the family Asterocheridæ Giesbr. into several small families, but this and similar questions are of slight importance in a faunistic paper as the present one. In the arrangement of the parasites on fishes I follow the work of Thomas & Andrew Scott: The British Parasitic Copepoda. Vol. I—II (1913), excepting as to a few points within the family Lernæopodidæ. A couple of genera parasitic on Annelida (*Selioides* Lev., *Sabellacheres* M. Sars) and not found in the works mentioned are inserted where they seem to have their nearest relatives; the genus *Tanypleurus* Stp. & Ltk., which is imperfectly known, is, in spite of sharp differences, put at the end of the Chondracanthidæ as its probably nearest relations. C. B. Wilson's valuable revisions of several families are,

of course, everywhere used and quoted. — A few genera remain, viz. two genera of the family Herpyllobiidae, the very anomalous endoparasite *Crypsidomus* Lev. and the enigmatic *Psilomallus* Kr.; they are placed at the end of the paper.

Not the slightest attempt of reform as to families or genera has been made. The material contain certainly a good number of new species, but only two among them differ so much from previously known forms, that it is necessary to establish new genera for their reception. And the number of genera represented in the material of any family or large division is much too small to make any attempt in classification. Unfortunately the quantity and quality of the specimens of several specimens established as new is unsatisfactory, as frequently only a single female or male was found, and such specimens even sometimes mutilated, with the result that the descriptions, especially of some Asterocheridae, are not as complete as desirable; I think, however, that it will always be possible to recognize the species established as new with absolute certainty. (Two species are completely omitted; one among them is represented by a single tiny and probably not adult specimen belonging to the semi-parasites and very different from any genus seen by me either in nature or in literature; the other form is endoparasitic within an Ophiurid and ovisacs were found, but the quality of the material was such that it was deemed completely impossible to study and make known the parasite.)

As to the bathymetrical occurrence it may be said here, that some species of Asterocheridae and Notodelphyoida have been found in sifted bottom material secured by the "Ingolf" in considerable depths, between 300 and 600 fathoms, and three species among the Asterocheridae even from 1199 or 1435 fathoms. It is of course impossible to decide whether the animals in question in every case lived at the bottom, or perhaps sometimes have been captured in the trawl (or dredge) while it was hauled upwards; I am apt to think that at least in most cases the animals lived really at the bottom, and if so our knowledge of the bathymetrical occurrence of members of these groups has been very considerably increased by the "Ingolf".

The geographical distribution of most of the species dealt with in the present paper is still very fragmentary. The records in the literature are too few¹; many species of parasites are far from common, and besides the inspection of fishes, Annelida, Malacostraca, etc. for finding parasites in hidden places has been too much neglected by zoologists or collectors. Furthermore the determinations in the literature are not always trustworthy; in some cases the figures or descriptions given by authors show differences from the animals seen by me of such a character that it is impossible to decide whether they are due to specific difference, to variation, or sometimes to oversights or inaccuracies by the authors. Especially the Asterocheridae are frequently difficult to examine, and often so very few specimens have been seen by the authors that deficiencies in our knowledge especially as to variation were unavoidable.

Before concluding these introductory remarks I beg Prof. Dr. T. Odhner accept my sincere thanks for having lent me the material of the Copepoda living on Annelids belonging to the Riksmuseum, Stockholm.

¹ It may be expressly said that A. Brian's work: *Copepodi parassiti dei Pesci d'Italia*. 4to. Genova, 1906, has not been accessible to me.

Division Harpacticoida.

No form of this gigantic division is known to be parasitic. But as Kröyer has described a species found on the branchiæ of a large shrimp from Greenland, it may be convenient to give some information on that animal.

Machairopus Hippolytes Kr.

1863. *Canthocamptus?* *Hippolytes* Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 408, Tab. XVIII, fig. 9, a—b

Kröyer established this species on a few specimens taken on the branchiæ of *Spirontocaris gröenlandica* J. C. Fabr. (*Hippolyte aculeata* O. Fabr., Kröyer). His description and figures are too imperfect for allowing the recognition of the form, but the Copenhagen Museum possesses two of his specimens moderately well preserved. The examination proved that the animal belongs to the genus *Machairopus* Brady, and the species is closely allied to *M. minutus* G. O. S. I have been unable to find any difference of undoubtedly specific value in the antennulæ, antennæ, maxillæ, maxillipeds and thoracic legs, excepting first pair of legs. But in this leg the exopod is conspicuously shorter in proportion to the endopod than in *M. minutus* and does not reach the end of the proximal joint of the last-named ramus, while the partly curious setæ on both rami are very similar to Sars' figure; in the maxillulæ the two extremely long terminal setæ are longer than in Sars' figure and, what is more important, one of the lobes has a very long, distally much curved seta directed backwards and inwards and reaching almost the insertion of the maxilliped on the opposite half of the ventral side, and this seta is not shown by Sars. There may be some other differences in the maxillulæ and perhaps in the mandibles, but more could not be perceived in these mouth-parts or in any other appendage without a dissection which I would not attempt, as the specimens are not only very small co-types, but besides fragile, as they are very old. One of the specimens is 0.85 mm. long, thus a little larger than *M. minutus*.

The specimens found by Kröyer have probably been introduced quite occasionally into the branchial cavity of the *Spirontocaris*; it is to be supposed that specimens can be gathered between algæ at West Greenland, and then a comparison with Kröyer's co-types and a special investigation and comparison with *M. minutus* may be undertaken.

Division Cyclopoida.

Cyclopina Claus.

This genus is mentioned, because a single new species has been found in Ascidians, and even at two localities. The material of free-living Copepoda has not been looked through for finding other forms of the genus or of the family Cyclopinidæ sens. Sars.

1. **Cyclopina Phallusiæ** n. sp.

(Pl. I, figs. 1 a—1 i.)

Female. — Rather allied to *C. gracilis* Claus and *C. longicornis* Boeck. It differs from all other species known in having the first thoracic segment marked off moderately distinctly from the head. The head (fig. 1 a) is flattened and therefore seemingly laterally expanded, being considerably broader than the first thoracic segment, which is considerably shorter than the second. — Genital segment distinctly longer than broad,

about as long as the three posterior segments combined; last segment about as long as broad and a good deal longer than the preceding one. Caudal rami a little shorter than the genital segment, with the seta on the outer margin behind the middle.

Antennulæ about as long as the head and composed of 17 joints (fig. 1 b); third joint much the longest, about as long as the three following joints combined; fourth and fifth joint very short, sixth and seventh moderately long, subequal in length and together nearly longer than the four following joints combined. — Antennæ (fig. 1 c) differ from those in all other northern species in having the third joint somewhat longer than the fourth; the terminal setæ are much shorter than usual, and one among them is in reality a somewhat small, spiniform and very curved hook. — Mandibles (fig. 1 d), maxillulæ (fig. 1 e), maxillæ (fig. 1 f) and maxillipeds (fig. 1 g) exhibit minor differences from those in allied forms excellently figured by Sars. — Fourth pair of thoracic legs (fig. 1 h) possesses on the outer side of third joint of the exopod 2 spines, and besides the usual much longer terminal spine. — Fifth legs (fig. 1 i) biarticulate; first joint very expanded outwards; second joint oblong-ovate, much longer and much narrower than the first, with 2 terminal setæ and 1 seta on each lateral margin, but without spines.

The ovisacs are large and very oblong, with a large number of somewhat small eggs.

Length 2.2 mm.; an ovisac is 0.83 mm. long and 0.37 mm. broad.

Remarks. The general aspect of the head and anterior thoracic segments in the two specimens seen shows that the animals are not free-living. It is surprising that a species of the genus *Cyclopina* lives within Ascidiæ; consequently I asked my old friend Prof. G. O. Sars, if he, who recently published an excellent account of the Norwegian forms, had met with any such thing in the literature; he answered that it was quite new and very interesting. *C. Phallusia* is instantly separated from all other species by the joints in the antennulæ, and above all by having the penultimate joints in the antennæ conspicuously longer than the terminal one; the ovisacs contain a much higher number of eggs than in any other northern species.

Occurrence. — Not taken by the "Ingolf", but secured by two Danish zoologists.

Færoes: Vestmanhavn. In *Phallusia obliqua*, June 18, 1906. Mag. sc. R. Hörring. 1 female.

South-West of the Færoes: Lat. 61°49' N., Long. 14°11' W. In *Phallusia obliqua*. Young-fish trawl, 800 m. wire out. Sept. 2, 1904. "Thor" (Dr. J. Schmidt). 1 female.

Ascomyzon Thorell.

Of this large genus 5 species are found in the material, but only 2 among them could be determined. The new forms are small and hauled up from considerable or great depths.

2. *Ascomyzon asterocheres* G. O. S.

1859. *Asterocheres Lilljeborgi* Boeck, Forh. Vid. Selsk. Christiania for 1859, p. 6, Pl. II.

1915. *Ascomyzon asterocheres* G. O. Sars, Account, Vol. VI, p. 85, Pl. LI & LII.

Occurrence. — This species has been gathered by the "Ingolf" at a single station.

Davis Strait: Stat. 29: Lat. 65°34' N., Long. 54°31' W., 68 fathoms, temp. 0°2; 3 specimens on a specimen of *Cribrella sanguinolenta* O. F. Müll.

Among the 3 specimens one is an ovigerous female placed on the lower side of the disk of the Asterid, another ovigerous female is found between two arms, and the third, a female without ovisacs, is fallen off. The last-named specimen has been investigated; it agrees on the whole well with Sars' figures, excepting that the postero-lateral angles of the head and of the two anterior free thoracic segments are a little more produced.

Distribution. — Taken by Boeck and Sars at the south coast and off the west coast of Norway. According to the somewhat intricate synonymy elucidated by Giesbrecht and Sars, the species has been noted by Brady from Ireland and by Scott and Giesbrecht from Firth of Forth, Firth of Clyde and Loch Fyne.

3. *Ascomyzon Boeckii* Brady.

1880. *Artotrogus Boeckii* Brady, Mon. Brit. Copep. Vol. III, p. 60, Pl. XCI, figs. 1—9.

1915. *Ascomyzon* — G. O. Sars, Account, Vol. VI, p. 88, Pl. LIV.

Occurrence. — Not taken by the "Ingolf", but by Mag. sc. W. Lundbeck at the following place. North-West Iceland: Talknafjord, 14 feet, ooze with much vegetation, July 4, 1899. 5 females.

Distribution. — Taken at Bukken, SW. coast of Norway, and at Rauö, west coast of Norway (G. O. Sars). Furthermore noted from Ireland (Brady), from the Island of Man (Thompson) and from Firth of Forth on *Chalina oculata* (Th. Scott). Finally near Hope Island (south-east of Spitzbergen), 27 fath. (Th. Scott). Giesbrecht's statement on its occurrence at Naples is considered doubtful by Sars.

4. *Ascomyzon intermedium* n. sp.

(Pl. I, figs. 2 a—2 g.)

Female. — Moderately broad; head about as broad as the length of first thoracic segment and head together. Posterior corners of the thoracic segments angular, scarcely rounded, not produced; third segment seen from above very short. — Genital segment (fig. 2 b) more narrow than in any described species, one-fourth as long again as broad, and the part in advance of the genital aperture is even slightly narrower than the front end of the posterior part; second abdominal segment considerably shorter than the third which is almost as long as broad; caudal rami with their outer margin decidedly longer than their breadth and slightly shorter than second abdominal segment.

Antennulæ with 20 joints, and as to the relative length of these joints so similar to those of the following species, *A. tenerum*, that the drawing (fig. 3 d) of this species is deemed almost sufficient; eleventh to seventeenth joint from considerably to very much longer than broad; eleventh joint rather long; from eleventh to fourteenth the joints decrease a little in length; fifteenth as long as eleventh; sixteenth (fig. 2 c) distinctly longer than fifteenth and somewhat shorter than seventeenth, which is slightly longer than the three distal joints together and four times as long as thick. — Antennæ (fig. 2 d) somewhat slender; terminal spine as long as the two distal joints together. — The siphon shaped nearly as in *A. latum* (comp. the figure on pl. LVI in Sars' Account) and reaches beyond the base of first legs. — Maxillulæ (fig. 2 e) with the inner branch moderately robust and with 3 of its terminal setæ a little to considerably longer than the branch; outer branch slender and short, only about one-fourth as long as the inner one, but at least one of its terminal setæ reaches

much beyond the end of the inner branch. — Maxillæ (fig. 2 f) rather slender; dactylus with claw much curved. — Maxillipeds (fig. 2 g) rather slender; dactylus with claw only a little longer than the basal part, and the claw considerably longer than the dactylus. (Fifth legs lost).

Length 0.86 mm.

Remarks. — *A. intermedium* is abundantly distinguished from every species figured by Giesbrecht and Sars by the relative length of the ten distal joints in the slender antennulæ, together with the maxillulæ, the narrow genital segment, the relative length of the other abdominal segments and the caudal rami. The differences between this species and the two following forms are pointed out below.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fathoms, temp. 3°3; 1 female.

5. *Ascomyzon tenerum* n. sp.

(Pl. I, figs. 3 a—3 k.)

Female. — Cephalothorax (fig. 3 a) conspicuously less broad than in the preceding form, and more slender than in any European species. Head slightly broader than long; the three thoracic segments with the lateral margins convex and the postero-lateral corners rounded; third segment well developed, somewhat long. — Genital segment (fig. 3 b) moderately narrow, somewhat longer than broad and broadest in front of the genital apertures. Second abdominal segment somewhat broader than long, a little longer than third segment; caudal rami as broad as long, with the outer margin a little shorter than the terminal segment.

Antennulæ (fig. 3 c) 20-jointed; the ten distal joints slender, eleventh to seventeenth joint considerably to very much longer than broad and rather unequal in length; eleventh joint rather long; from eleventh to fourteenth the joints decrease, and from the last-named to seventeenth they increase considerably in length, so that the seventeenth joint, which is four and a half times as long as thick, is as long as thirteenth and fourteenth together or as the eighteenth to twentieth together. — Antennæ (fig. 3 c) long and very slender; terminal spine somewhat or considerably longer than the two distal joints together. — Siphon (fig. 3 c) reaches beyond the insertion of first legs or beyond that of second legs, and it is shaped nearly as in *A. latum* figured by Sars. — Maxillulæ (fig. 3 c) with the inner branch long and slender, and three among its four terminal setæ nearly half as long again as the branch; outer branch very small and thin, only a little more than one-fifth as long as the inner, while its longest terminal seta reaches about to the end of the inner branch. — Maxillæ (fig. 3 c) slender; dactylus with claw not half as long again as the proximal part. — Maxillipeds (fig. 3 c) long and very slender; claw more than half as long again as the dactylus. — Fifth legs (fig. 3 e) very oblong, only with the 2 terminal setæ.

Length 1 mm.

Male. — As usual more slender than the female and differing in the antennulæ, the maxillipeds, and the abdominal segments. — Genital segment (fig. 3 k) from scarcely as broad as to slightly broader than long, with a small tooth on each postero-lateral angle. Last segment somewhat broader than long, slightly shorter than the two preceding segments together. Caudal rami a little longer than broad, and their outer margin distinctly shorter than that of the last segment.

Antennulæ (fig. 3 f) 17-jointed; eleventh to seventeenth joint together half as long again as the sum of the ten proximal joints; eleventh joint as long as, but much thicker than, the sixteenth very slender joint, and distinctly shorter than the very long fifteenth joint, while the fourteenth is short, as broad as long, the thirteenth somewhat longer and besides somewhat thick. — Maxillipeds (fig. 3 i) more slender than in the female and with a triangular protuberance on the distal joint of the proximal portion somewhat from its base.

Length 0.85 mm.

Remarks. — The female of *A. tenerum* differs from *A. intermedium* in having the cephalothorax rather oblong, the antennæ, maxillulæ, maxillæ, and maxillipeds more elongated and slender, with the terminal spine or claw, or in the maxillulæ the terminal setæ of the inner branch, conspicuously or even considerably longer than in that species, finally by the relative dimensions of the abdominal segments. The male is instantly separated from all other males hitherto described by the relative length of the joints in the antennulæ.

Occurrence. — Gathered by the "Ingolf" at a single station.

Davis Strait: Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fathoms, temp. 3°3; 5 females, 3 males.

6. *Ascomyzon abyssi* n. sp.

(Pl. I, figs. 4 a—4 d.)

Male. — A single mutilated specimen is to hand; it is allied and rather similar to the male of *A. tenerum*, but differs in some particulars. Genital segment (fig. 4 d) larger than in *A. tenerum*, as long as broad. Last segment nearly as long as broad, and somewhat longer than the two preceding segments together. Caudal rami slightly longer at the outer margin than broad, and much shorter than the terminal segment.

Antennulæ probably 17-jointed, but only 15 joints are preserved (fig. 4 a); eleventh joint somewhat longer than the next, but considerably shorter and thicker than in *A. tenerum*, conspicuously less than half as long again as broad, while in *A. tenerum* it is twice or more than twice as long as broad; fifteenth joint more than half as long again as eleventh and conspicuously longer than fourteenth and thirteenth joints together. — Antennæ (fig. 4 b) with the terminal spine only as long as the penultimate joint. — Siphon (fig. 4 b) reaches only slightly beyond the insertion of the maxillipeds. — Maxillulæ (fig. 4 b) with the inner branch less elongated and broader than in *A. tenerum*, but its terminal setæ half as long again as the branch; outer branch about one-third as long as the inner, but two of the terminal setæ reach beyond its end. — Maxillæ (fig. 4 b) and maxillipeds (fig. 4 c) with the terminal claw less elongated than in *A. tenerum*.

Length 0.88 mm.

Remarks. — Instantly separated from the male of *A. tenerum* by the eleventh to fifteenth joint in the antennulæ, and by the abdominal segments.

Occurrence. — Taken by the "Ingolf" at a single deep station.

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fathoms, temp. 1°5; 1 male.

Dermatomyzon Claus.

Only a single species has been found within our area.

7. *Dermatomyzon nigripes* Brady.

1880. *Cyclopicera nigripes* Brady, Mon. Brit. Copep. Vol. III, p. 54, Pl. LXXXIX, figs. 1—11.

1899. *Dermatomyzon* — Giesbrecht, Asterocheriden, p. 7, 77, 101; Taf. 1, Fig. 4; Taf. 5, Fig. 1—14.

1915. — — G. O. Sars, Account, Vol. VI, p. 95, Pls. LIX & LX.

Occurrence. — Not taken by the "Ingolf", but by Dr. F. Börgesen in May 1898.

Færoes: Glyvenæs near Thorshavn, Strömö; 4 adult females.

Distribution. — "Not unfrequently along the whole Norwegian coast, from the upper part of the Christiania Fjord to Vadsö, in moderate depths" (G. O. Sars). Recorded from the Norway Islands at Spitzbergen, between algæ (G. O. Sars), from lat. $76^{\circ}17' N.$, long. $21^{\circ}36' E.$, 60 fath. (Th. Scott), and from Franz Joseph Land off East Glacier, Cape Flora (Th. Scott). At Great Britain found in many places and in moderate depths, from Shetland to the Channel, f. inst. near Plymouth (various authors), finally at Naples (Giesbrecht). — Whether *D. elegans* Claus from Trieste (Claus) and Pas de Calais (Canu) is the same species the future must decide.

Scottocheres Giesbrecht.

Of this genus only a single form has been captured.

8. *Scottocheres gracilis* n. sp.

(Pl. I, figs. 5 a—5 d.)

Female. — This species is similar and closely allied to *S. longifurca* Giesb., but differs from Giesbrecht's representation in some particulars. — Head and thoracic segments nearly as in *S. longifurca*. — Genital segment (fig. 5 d) more narrow than in that species, being half as long again as broad, and the anterior broader part is very much shorter than the part behind the lateral teeth, as these originate slightly behind the end of the anterior third of the segment, while in *S. longifurca* they are placed slightly before the middle; finally each lateral tooth has on the interior margin an angular protuberance wanting in the other species. Second abdominal segment (fig. 5 d) not half as long as the first and nearly half as long again as the third, which is very slightly broader than long, thus more slender than in *S. longifurca*. Caudal rami slightly more than twice as long as the terminal segment and slightly shorter than second and third segments combined, five times as long as broad, thus longer and more slender than in *S. longifurca*.

Antennulæ (fig. 5 a) agree with those in *S. elongatus* and differ from *S. longifurca* in having third and fourth joints completely fused; the eight distal joints are proportionately more slender and longer than in *S. longifurca* as figured by Giesbrecht. — The length of the siphon, maxillæ (fig. 5 b), and maxillipeds (fig. 5 c) nearly as in that species; the same is the case with the setæ on the endopod of third legs. In the specimen the left fifth leg preserved reaches conspicuously beyond the lateral tooth of the genital segment, while in Giesbrecht's figure these legs terminate somewhat before the base of these teeth.

Length 1.05 mm.

Remarks. — The differences pointed out between my single specimen and Giesbrecht's figure and description of *S. longifurca* are so conspicuous that it is deemed necessary to establish the new species.

Occurrence. — Taken by the "Ingolf" at a single deep station.

South-West of Iceland: Stat. 78: Lat. $60^{\circ}37'$ N., Long. $27^{\circ}52'$ W., 799 fathoms, temp. $4^{\circ}5'$; 1 specimen.

Acontiophorus Brady.

Of this fine genus not only the two species known from Great Britain and Norway have been found in our area, but it has even been necessary to establish a third species from very deep water.

9. *Acontiophorus ornatus* Brady & Robertson.

(Pl. I, fig. 6 a.)

1876. *Ascomyzon ornatum* Brady & Robertson, Brit. Assoc. Report for 1875, p. 197 [test. Brady].

1880. *Acontiophorus ornatus* Brady, Mon. Brit. Copep. Vol. III, p. 71, Pl. LXXXVII, figs. 8—15.

1899. — — Giesbrecht, Asterocheriden, p. 14, 82, 104; Taf. 4, Fig. 29—34.

!1921. — — G. O. Sars, Account, Vol. VII, p. 109, Pl. LXXII.

An exceedingly large female, measuring 2.26 mm. to the end of the caudal rami, agrees in most features well with the descriptions and figures published by Sars and Giesbrecht. The antennulæ (fig. 6 a) contain exactly the same number of joints as stated by these authors, and the relative length of the joints is characteristic; besides antennæ, maxillæ and maxillipeds agree completely with the figures quoted. The only differences observed are the following. The two anterior thoracic segments have the posterior margin rather concave, as the lateral parts of each segment is produced somewhat backwards and the posterior corner is a rather acute angle; third segment has the broad median part of the posterior margin very concave, while the lateral part of the segment is not produced backwards but directed outwards, and each postero-lateral corner is distinctly rounded. — Fifth pair of legs agrees excellently with Brady's drawing (l. c. fig. 15), as the rather broad end has 2 setæ, the outer (anterior) margin has a single seta and the inner (posterior) margin 2 setæ, while in Giesbrecht's and Sars' figures of this leg the rather produced end is much more narrow with a single seta, and the inner margin has 3 setæ.

Occurrence. — Taken by the "Ingolf" at a single deep-sea station.

Davis Strait: Stat. 24: Lat. $63^{\circ}06'$ N., Long. $56^{\circ}00'$ W., 1199 fathoms, temp. $2^{\circ}4'$; 1 female.

Distribution. — Risør, southern coast of Norway (G. O. Sars); east coast of England near Scarborough (Brady); finally in the Mediterranean at Naples (Giesbrecht) and at Trieste (Claus).

10. *Acontiophorus scutatus* Brady & Robertson.

1873. *Solenostoma scutatum* Brady & Robertson, Ann. Mag. Nat. Hist. ser. 4, Vol. XII, p. 141.

1880. *Acontiophorus scutatus* Brady, Mon. Brit. Copep. Vol. III, p. 69, Pl. XC, figs. 1—10.

1892. — — Canu, Travaux Labor. Zool. Maritime de Wimereux-Ambleteuse, Vol. VI, p. 271, Pl. XXIX, figs. 1—4.

!1899. — — Giesbrecht, Asterocheriden, p. 14, 81, 104; Taf. 1, Fig. 5; Taf. IV, Fig. 35—52.

!1915. — — G. O. Sars, Account, Vol. VI, p. 110, Pl. LXVII.

Occurrence. — Not taken by the "Ingolf", but by Dr. F. Börgesen in May 1898.

Færoes: Glyvenæs near Thorshavn, Strömö; 1 female.

Distribution. — West coast of Norway at Aalesund, 10 fath., and at Kalvaag (G. O. Sars); "distributed round the British Islands", both in surface-net during night and dredged, down to forty fathoms (Brady); Wimereux and Pas-de-Calais, in low water (Canu); in the Mediterranean at Triest (Claus) and at Naples (Giesbrecht). — G. M. Thompson's statement (1883) that this species occurs in Otago Harbour, New Zealand, is most probably wrong.

11. *Acontiophorus antennatus* n. sp.

(Pl. I, figs. 7 a—7 d.)

Female. — This species is closely allied to *A. scutatus*, but differs in a few particulars. Two specimens are to hand, the large one 1.23 mm. long (caudal rami included), thus somewhat larger than *A. scutatus*, while the other specimen is 0.79 mm. — Antennulæ with 11 joints and completely as in *A. scutatus*, excepting that the distal sensory filament preserved (in the large specimen) is considerably longer than the whole antennula. — The antennæ differ materially from those in *A. scutatus*; in the inner ramus the second joint is from about half as long again to twice as long (fig. 7 b) as the first, and near the end with about 4 spines instead of setæ; the outer ramus is long and reaches far beyond the middle of second joint of the other ramus; the peduncle has a few setæ somewhat from the end. — Siphon considerably shorter than in *A. scutatus*, as in the large specimen it reaches to the middle of the genital segment, in the small specimen scarcely to the base of that segment. — Maxillæ (fig. 7 c), maxillipeds (fig. 7 d), and the other appendages do not seem to show any appreciable difference from those in *A. scutatus*. — Caudal rami in the small specimen scarcely as long as third plus half of second abdominal segment, and each ramus is only two and a half times as long as broad; in the large specimen the rami are elongated (fig. 7 a), as long as the two posterior segments together, and each ramus is only a little less than five times as long as broad.

Remarks. — It is only after prolonged hesitation that this species is established. Giesbrecht has pointed out some variation in *A. scutatus*, but the fact that the siphon is considerably shorter than in *A. scutatus*, together with the striking differences in the antennæ make the reference of the two specimens to *A. scutatus* rather difficult. The strong difference in length and slenderness of the caudal rami between the two specimens is curious, but may be due to age.

Occurrence. — Taken by the "Ingolf" at a single deep station.

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fathoms, temp. 1°5; 2 females.

Metapontius n. gen.

Cephalothorax in the female greatly expanded, in the male considerably more narrow; the head in the female exceedingly large with the postero-lateral corners nearly rectangular and not produced, while third and fourth segments are very short, and the sternite of the fourth is extremely short. — Abdomen short with the genital segment of very moderate breadth; caudal rami rather large.

Antennulæ proportionately somewhat short, in the female with 14, in the male with 17 joints. — Antennæ robust, 4-jointed as usual, with thick distal spines; an exopod not discovered (?wanting or rudimentary).

— Siphon nearly pear-shaped, without suctorial tube, reaching to the base of the maxillipeds. — Maxillulæ with both rami moderately short, the outer slightly longer than the inner. — Maxillæ unusually robust; maxillipeds robust, especially in the female. — First pair of legs with the exopod very broad, its terminal joint with 5 setæ and 3 very broad spines; fourth pair of legs with the exopod well developed, normal, while the endopod is quite small, 2-jointed. Fifth pair of legs only rudimentary knots.

Remarks. — The present genus, established on a single new species, agrees with *Arctopontius* in several features, especially in the reduced state of the endopod of fourth legs, the rudimentary state of fifth legs, and the strongly built maxillæ and maxillipeds, but it differs sharply in some characters, viz. the antennulæ have a much higher number of joints, the siphon has no terminal tube, the genital segment is only moderately expanded, finally the antennæ and maxillulæ show minor differences.

12. *Metapontius latispinis* n. sp.

(Pl. I, figs. 8 a—8 i.)

Female. — Cephalothorax about as broad as long (the specimen drawn in fig. 8 a was a little pressed). Head four times as long as the free thoracic segments combined, with the postero-lateral angles not produced; these angles are not produced on the first, but a little on second segment. — Abdomen (the caudal rami not included) scarcely one-third as long as the cephalothorax. Genital segment (fig. 8 b) somewhat broader than long; second and third segments short, together slightly longer than the terminal segment, which is distinctly broader than long. Caudal rami (fig. 8 b) broad, lamellar, and as long as the two posterior segments combined.

Antennulæ (fig. 8 c) 14-jointed; second to eighth joint subequal in length; ninth joint as long as seventh and eighth together, tenth considerably shorter than the ninth; the joints increase gradually in length from the tenth to the thirteenth, while the terminal joint is almost as long as the three preceding joints together and shows the vestige of a division at the middle. — Antennæ (fig. 8 c) with second and third joints proportionately short, each much shorter than the fourth joint, which has a very strong lateral spine and 2 terminal spines, one among them very thick. — Siphon (fig. 8 c) a little more than twice as long as broad. — Maxillæ (fig. 8 d) extremely robust; dactylus with claw a little longer than the proximal part, distally very curved and with a minute protuberance on the concave margin. — Maxillipeds (fig. 8 e) strong; dactylus about half as long again as the claw, and its terminal spine at the base of the claw short and extremely broad. — The spines on the natatory legs are very broad; the exopod of first pair (fig. 8 f) considerably longer and much broader than the endopod, especially its third joint is very large. The endopod of fourth pair of legs (fig. 8 g) only slightly more than one-third as long as the exopod, and its second joint is twice as long as the first.

Length 1.07 mm. (caudal rami included).

Male. — Cephalothorax (fig. 8 h) much less broad than in the female, a little less than half as long again as broad. Head about twice as long as the thoracic segments combined, and these as long as the abdomen without caudal rami.

Antennulæ (fig. 8 i) 17-jointed; second to ninth joint very short, tenth joint a little longer than the three preceding joints combined, twelfth joint considerably shorter than the tenth and somewhat longer than

the eleventh, with a long and strong spine and two sensory filaments, while seventh to eleventh joint each with a single similar filament. The two distal joints equal in length, each as long as fourteenth and fifteenth joint together.

Length 0.75 mm.

Occurrence. — Taken by the "Ingolf" at a single station.

North-West of the Færoes: Stat. 138: Lat. $63^{\circ}26'$ N., Long. $7^{\circ}56'$ W., 471 fathoms, temp. $\div 0^{\circ}6$;
1 female, 1 male.

Arctopontius G. O. Sars.

The single species of this genus has been found in the "Ingolf" area.

13. *Arctopontius expansus* G. O. Sars.

(Pl. II, figs. 1 a—1 d.)

1915. *Arctopontius expansus* G. O. Sars, Account, Vol. VI, p. 122, Pl. LXXII.

A single ovigerous female (fig. 1 a) differs in general outline somewhat from Sars' figure in looking shorter in proportion to breadth, but at a closer examination it is observed that the difference is due to the fact that in my specimen the posterior thoracic and especially the anterior abdominal segments are considerably more telescoped, and the abdomen besides not horizontal but directed somewhat downwards, so that the segments seem to be shorter than they really are, but it was impossible to alter that direction without running some risk. The antennulæ, the maxillæ (fig. 1 b), the maxillipeds (fig. 1 c) and the very characteristic fourth pair of legs (fig. 1 d) show very close agreement with Sars' drawings, so that no doubt as the identification remains. (Only two small points may be mentioned, viz. that Sars figures the terminal thick seta on the antennæ somewhat shorter than it is in my specimen, and that the four distal setæ on third joint of the exopod of fourth legs are somewhat longer in my specimen than shown by Sars, but in some cases I have observed that Sars has drawn such setæ a little too short).

The right ovisac is preserved; it is nearly globular and, as indicated by a dotted line on the figure, placed on the lower side of the thoracic segments, a feature giving the very broad animal a considerable superficial resemblance to the semiglobular *Artotrogus orbicularis* Boeck.

Length 1.76 mm.

Occurrence. — Not gathered by the "Ingolf" but by the "Fylla" (Theodor Holm), July 18, 1884. Davis Strait: Lat. $67^{\circ}41'$ N., Long. $54^{\circ}28'$ W., 32 fathoms, stones without algæ; 1 female.

Distribution. — Only two specimens were known, both from Hammerfest, western Finmark, about 20 fath. (G. O. Sars).

Bradypontius Giesbr.

To this genus 4 species from the "Ingolf" area are referred, and all apparently new to science. Three of these forms are typical members of the genus as circumscribed by Sars, while the fourth species differs in having the fifth pair of legs much more developed, but nevertheless I find it most convenient to refer it provisionally to *Bradypontius*, until more knowledge has been obtained. The material is insufficient, as only a

single specimen of each of the three species is to hand; besides the quality of the specimens was not very good. I hope, however, that the following descriptions with figures are fully sufficient for making the forms easily recognisable with absolute certainty, especially as the distal part of dactylus with claw of the maxillipeds affords excellent specific characters in showing — under a rather high magnifying power — great differences in the equipment with minutes spines, tubercles, etc. I have also arrived at the result that forms referred to the same species by different authors are in some cases scarcely identical, and that a revision based on a large material from many localities far from each other is much needed.

14. **Bradypontius groenlandicus** n. sp.

(Pl. II, figs. 2 a—2 m).

Female. — Cephalothorax a little less than half as long again as broad. The head more than three and a half times as long as the free thoracic segments combined, with the postero-lateral corners somewhat produced but rounded, and anteriorly no dorsal crest. The corners of the free thoracic segments much produced (fig. 2 a), acute; third segment very short, and its posterior angles reach about or not fully as far backwards as those of second segment. — Genital segment (fig. 2 b) somewhat less than twice as broad as long; the two following segments short, together about as long as the terminal segment, which is conspicuously broader than long. Caudal rami about as long as the terminal segment, broad.

Antennulæ (fig. 2 c) somewhat less than half as long as the head, with 11 joints; the second joint is rather short, the third as long as the three following joints combined, the fifth as long as the sum of fourth and sixth, seventh joint slightly longer than the fifth and considerably longer than the eighth which is a little shorter than ninth and tenth joint together; eleventh joint slightly longer than the three preceding joints combined. — Antennæ (fig. 2 d) slender; terminal joint somewhat longer than the third, and its middle apical seta is long. — Siphon reaches to the middle of the sternite of second free segment; its proximal part is somewhat slender as in *B. magniceps* as figured by Sars. — Maxillulæ (fig. 2 e) slender, with the inner branch considerably longer than the outer, and the terminal seta of the first-named branch is long (though its distal part is lost); the terminal setæ on the outer branch long, but the longest one is broken. — Maxillæ (fig. 2 f) have the dactylus with claw slender and somewhat longer than the proximal portion; the claw is somewhat long with a close row of tiny spines along somewhat less than the proximal half of its concave margin (fig. 2 g), and on the proximal half of one of its sides with a close row of tiny triangular denticles; the distal part of the dactylus has a rather long lateral spine about as far before the claw as the length of the latter, furthermore a little before the long spine a short, tumid spine on the other side of the dactylus near its concave margin, and finally somewhat beyond the long spine and on the same side a rounded protuberance with a number of tiny, slender denticles. — Maxillipeds (fig. 2 h) normal; the claw as long as the dactylus; which consists of three joints. — Fourth pair of legs (fig. 2 i) with the endopod only about as long as the two proximal joints together of the exopod, but its joints are conspicuously broader than in any of the Norwegian species figured by Sars. — Fifth legs is a minute joint as broad as long, with three bristles.

Length 2.25 mm.

Male. — Cephalothorax (fig. 2 k) more slender than in the female, about two-thirds as long again

as broad. Third free segment covered excepting the postero-lateral corners, which are far from reaching the end of those from second segment.

Antennulæ (fig. 2 l) scarcely half as long as the head, 13-jointed. Third joint about as long as the five following joints together; tenth joint longer than the sum of the four preceding joints, with three spines on the outer margin, the first of very moderate length and the two others short and robust; eleventh joint slightly longer than the thirteenth, and both these together about as long as the twelfth. One sensory filament on the second, fourth, sixth, seventh, eighth and ninth joint, 3 similar filaments on the third, and 2 on tenth joint. — Fourth pair of legs (fig. 2 m) shows conspicuously less difference in length and breadth of the joints respectively in the endopod and the exopod than in the female, as the endopod is proportionately more developed, and it terminates in a thick and very curved spine.

Length scarcely 2 mm.

Remarks. — This species is allied to *Bradypontius major* established and figured by Sars, but the female differs in being somewhat smaller, without dorsal crest in front, in having only 11 joints in the antennulæ while 13 are found in *B. major*; furthermore the claw of the maxillipeds is proportionately longer than in *B. major*, while the dactylus of the maxillæ is more slender, but unfortunately Sars has not specially investigated the equipment with spinules etc. of the dactylus and the claw. The male differs very considerably from that of *B. major* both in the armature of tenth joint of the antennulæ and in the shape and distal equipment of the terminal joint of the endopod in fourth legs.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fathoms, temp. 3°9; 2 females, 3 males.

15. *Bradypontius dentatus* n. sp.

(Pl. II, figs. 3 a—3 e).

Female. — Only a single specimen with several among the appendages mutilated is to hand. It is allied to, but considerably smaller than, *B. caudatus* G. O. Sars, and it may nearly be sufficient to point out the differences observed.

The head is somewhat more narrow (fig. 3 a); the frontal crista is broad, and the postero-lateral corners distinctly more produced, acute. The three anterior free segments have their lateral parts produced extremely backwards into very oblong lobes, which are proportionately somewhat or considerably longer than in *B. caudatus* (fig. 3 a shows the anomaly that the right lobe of first segment is much shorter than the left and certainly misshaped). — Abdomen proportionately slightly shorter than in *B. caudatus*, second and third segment being rather short, each much shorter than the fourth, which is a little broader than long and as long as the caudal rami.

Antennulæ (fig. 3 b) with 10 distinct joints, and an eleventh is indistinctly indicated towards the distal end of the third joint. When not counting that indistinct joint the fifth joint is more than twice as long as the fourth and somewhat shorter than the seventh; the eighth and the ninth joint both somewhat shorter than the seventh and together distinctly shorter than the terminal joint; in *B. caudatus* the joint answering to the seventh in *B. dentatus* is divided into two well developed, shorter joints. — The antennæ differ from

those in *B. caudatus* in having the terminal joint only a little longer than the third; besides one of the terminal setæ is rather long, the other quite short. — The siphon reaches about to the middle of first free segment, is consequently longer than in *B. caudatus*. — In the maxillulæ the outer ramus is considerably longer than the inner, and one of its terminal spines seems to be longer than the ramus and only somewhat shorter than the other terminal spine; inner ramus with its terminal bristle longer than in *B. caudatus*. — Maxillæ (fig. 3 c) with the dactylus somewhat longer than the proximal portion, slender; the adornment towards its end (fig. 3 d) is most peculiar, showing a rather long lateral spine and slightly beyond its insertion a marginal tooth, furthermore a lateral row of teeth beginning near the middle of the spine, terminating beyond its end, and the teeth increase gradually in size in the distal direction; on the most distal part of the dactylus is seen a longitudinal lateral row of triangular teeth, and besides a short row of 5 spines close together on the margin, while the claw does not show any adornment; in *B. caudatus* the spine and the marginal tooth are drawn by Sars, but his figure does not allow a closer comparison. — Maxillipeds (fig. 3 f) differ from those in *B. caudatus* in having the claw much longer than the preceding joint, while in that species the claw is slightly longer than the unusually long terminal joint. (The natatory legs are so mutilated that a comparison is impossible.)

Length 2.29 mm.

Occurrence. — Taken by the "Ingolf" at a single station.

Denmark Strait: Stat. 90: Lat. $64^{\circ}45'$ N., Long. $29^{\circ}06'$ W., 568 fathoms, temp. $4^{\circ}4'$; 1 female.

16. *Bradypontius unidens* n. sp.

(Pl. II, figs. 4 a—4 g.)

Male. — Cephalothorax twice as long as abdomen, caudal rami included (fig. 4 a). Head somewhat more than twice as long as the thoracic segments and somewhat broader than long, with the posterolateral corners very feebly produced. The thoracic segments decrease in the median line slightly in length from the first to the third, and these segments have their tergites strongly, nearly semicircularly, curved, and their lateral parts are strongly produced with the angles acute. — In the abdomen (fig. 4 b) third and fourth segments are rather short, together about as long as the terminal segment, which is distinctly broader than long and as long as the caudal rami.

Antennulæ (fig. 4 c) consist probably of 12 joints (the number cannot be stated with certainty because the eleventh joint is somewhat damaged); second joint slightly longer than the first, with 3 sensory filaments; third to eighth joint short, and each, excepting the fourth, with a filament; ninth joint with 2 sensory filaments, on the outer margin with a rather long and strong spine slightly before the middle, and beyond that spine 3 small spines, the two more proximal shaped as teeth, while the third is normal. — Antennæ and maxillulæ mutilated. — The siphon reaches to the front margin of first free segment; its proximal part is uncommonly slender, but not narrowed in front. — Maxillæ (fig. 4 d) with the dactylus long and slender; this joint has a good-sized lateral spine considerably before the end (fig. 4 e), but no conspicuous tooth or tubercle, and the most distal part has a little from the concave margin a long row of 13 acute denticles; the claw has near the margin 11 fine denticles arranged in a long row, which begins somewhat beyond the base. — Maxillipeds (fig. 4 f) with the claw as long as the whole dactylus. — Fourth pair of thoracic legs (fig. 4 g)

has the endopod rather slender with the third joint three times as long as broad, but its terminal part is regularly shaped without any spine. — The free joint of fifth pair of legs minute.

Length 1.65 mm.

Remarks. — Though the description is incomplete, as some of the appendages were mutilated in the single specimen, it may in all probability be sufficient for determining not only the male sex, but also the hitherto unknown female, as the equipment of dactylus and claw of the maxillæ is certainly similar in both sexes and besides very characteristic. It is closely allied to *B. magniceps* Brady as figured by Sars, but the male of this species was unknown to Sars, and his female seems to differ in the dactylus and claw of the maxillæ, though it must be remembered that his figure of these parts is too small. Whether *B. magniceps* Sars is identical with Brady's form or with that described under the same name by Giesbrecht seems to be somewhat uncertain.

Occurrence. — Not taken by the "Ingolf", but by Mag. sc. Kruuse at a single place.

East Greenland: Ameralik (Lat. 65°51' N.), low water; 1 male.

17. *Bradypontius*(?) *tenuipes* n. sp.

(Pl. II, figs. 5 a—5 f.)

Female. — A single specimen with the left lateral part of the three anterior free segments misshaped and most of the appendages mutilated is to hand, but as the dactylus of the maxillæ is extremely characteristic, the thicker part of the siphon narrow in front, and the free joint of fifth pair of legs long, the species is so peculiar that it is easily recognized and is therefore not omitted. In spite of the great difference in fifth legs between this species and the typical forms of *Bradypontius*, it is, at least provisionally, referred to this genus.

Head somewhat broad, with the postero-lateral corners only a little produced and very broadly rounded. The two anterior free segments (fig. 5 a), have the lateral part on the right side produced strongly backwards with the end acute, and third segment is somewhat less produced. — Abdomen (fig. 5 a) as to length about as in *B. papillatus* Scott; second and third segment only moderately short, together half as long again as the terminal segment, which is distinctly broader than long and a little longer than the caudal rami, on which the outer seta is inserted considerably before the end.

Antennulæ and antennæ mutilated. — The siphon seems to have its suctorial tube broken, so that its length cannot be stated, but its proximal part (fig. 5 b) differs from that in any form of the group figured by Sars in being narrow in front and gradually increasing in breadth, though on the whole rather narrow. — Maxillulæ with the inner ramus long and slender, somewhat longer than the outer very slender ramus; the terminal seta of the last-named ramus broken, but its preserved part a good deal longer than the ramus; the two terminal setæ on the inner ramus very long. — Maxillæ (fig. 5 c) have the dactylus a good deal longer than the proximal part and most peculiar; at the end of its proximal two-thirds the concave margin has a nearly spiniform tooth, and slightly beyond half of the distal third a rather large, oblong, oblique process; beyond this process (fig. 5 d) the dactylus is expanded, raised as a very low and very oblong triangle, then armed with a few tiny and closely set denticles, while the most distal part of the dactylus is much curved; on the

side and a little in front of the rather large process a somewhat long and strong spine is inserted on a tubercle; the claw has no denticles. — Maxillipeds (fig. 5 e) with the claw as long as the whole dactylus; first joint of the proximal part with a row of several long hairs on the margin; second joint with a row of shorter hairs at the middle of the outer margin. — Fourth pair of legs has the endopod shorter and more narrow than the exopod, though broader than in any species of *Bradypontius*. — Fifth legs with the free joint rather long (fig. 5 f), though somewhat shorter than the segment; the joint is slender, several times longer than thick, with 2 terminal setæ, and a somewhat shorter though yet rather long seta on the outer margin.

Length 1.6 mm.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fathoms, temp. 3°9; 1 mutilated female.

Parartotrogus T. & A. Scott.

Of this very interesting genus one species has been found in our area.

18. *Parartotrogus arcticus* (T. Scott), G. O. Sars.

(Pl. II, figs. 6 a—6 d.)

1901. *Parartotrogus Richardi*, var. *arcticus* T. Scott, Ann. Mag. Nat. Hist. S. 7, Vol. VIII, p. 352, Pl. VI.
1915. — *arcticus* G. O. Sars, Account, Vol. VI, p. 136, Pl. LXXIX.

The single female agrees with Sars' figures and description in most features, especially in such important points as the joints in the antennulæ, and three joints in the endopod of third legs; the few differences observed may be noted.

The antennæ (fig. 6 c) are a little more slender, their exopod a little shorter in proportion to the third joint, and the hook-shaped very thick spine on fourth joint is larger than in Sars' figure. — In the maxillæ (fig. 6 d) the curvature of the terminal claw differs considerably from Sars' figure, but this may, as least partly, be due to some casual fact, as the claw drawn by Sars has either been somewhat anomalous or is turned in a way producing an anomalous aspect; the claw on my specimen agrees more with Scott's figure. — The rudimentary fourth leg (fig. 6 a) has two setæ very different in length and a third seta on the posterior margin, while Sars has only the two terminal setæ nearly equal in length and no posterior seta; fifth leg (fig. 6 a) has not only the two terminal setæ, but besides on both legs two well developed setæ near one another near the base of the posterior margin, thus agreeing with Scott's figure, while Sars has the two terminal setæ and on the hind margin a single seta; finally both Sars and Scott figure these legs shorter and considerably broader than they are in my specimen. — Furca (fig. 6 b) is anomalous in my specimen; the right ramus is a tiny triangle, while the left ramus is normally shaped, but it is a little shorter than the terminal segment and possesses a single moderately long seta, which has its proximal part swollen and a secondary outer branch a little from the base. — Length 0.81 mm.

Occurrence. — Not gathered by the "Ingolf", but by the Ryder Expedition in 1891.

Off East Greenland: Lat. 72°27' N., Long. 19°56' W., about 100 fathoms; 1 female.

Distribution. — In Norway at Kvalö, on the Nordland coast, 40—50 fath. (G. O. Sars); furthermore east of Hope Island (south-east of Spitzbergen), 100 fath., and off Kolgujuk Island (rather far south-west of Novaya Zemlia) (Th. Scott).

Pseudomolgus G. O. Sars.

This genus is the only representative for the family Lichomolgidae sens. Sars hitherto found in the "Ingolf" area, and even only a single species has been discovered. Sars describes in his Account 8 genera with 24 species from Norway, and it must certainly be possible to collect several of these forms at the Færoes, Iceland or Greenland.

19. **Pseudomolgus groenlandicus** n. sp.

(Pl. II, figs. 7 a—7 g.)

Female. — In general aspect rather similar to *P. dilatatus* G. O. S., but it differs from all 3 Norwegian species in some features. — The body is nearly half as broad as long (caudal rami included) and broadest at the posterior angles of the head (fig. 7 a); the abdomen is shorter in proportion to the cephalothorax than in other species. The front part of the head is a little produced between the antennulæ, which therefore are inserted on the sides of this quite short frontal plate. Last thoracic segment broader than the genital segment, which is slightly broader than long (fig. 7 b); second and third abdominal segment very short, taken together even conspicuously or slightly shorter than the anal segment, which is about as broad as long and somewhat shorter than the genital segment. Caudal rami only a little longer than the last segment, and the seta on the outer margin is inserted distinctly before the middle. — Ovisacs large, very oblong, with numerous small eggs.

Antennulæ (fig. 7 c) as usual 7-jointed, a little shorter than the head; fifth joint as much shorter than the fourth as longer than the sixth. — Antennæ (fig. 7 d) very robust; first joint with a slender and small process near the end; the 4 apical claws strong, with a very sharp bend or a kind of articulation at the middle, while their distal half is very much curved; the setæ on the last joint may be seen on the figure. — Distal portion of the maxillæ (fig. 7 e) characteristic, with 6 processes, the first rather short and not marginal, the four following processes marginal and strong, while the terminal process is unusually long and distally thin. — First legs when seen from below (fig. 7 f) with rows of fine spines at the outer distal edge of first joint, and on the distal margin of second joint at both sides of the origin of the endopod, furthermore on half of the outer margin of first joint of the exopod and along the outer part of the distal margin of first joint of the endopod; endopod much more slender than in the Norwegian forms, with the third joint long, while the second joint is about half as long as the third; the exopod has the first joint long and very broad, expanded outwards, with the outer margin very convex, the second is not half as long as the first. The number of setæ and spines on these legs as in *P. dilatatus*; in second to fourth pair of legs the terminal joint of both rami possesses 3 spines on the outer margin, besides the terminal spine. — Fifth leg (fig. 7 g) not quite three times as long as broad, thus broader than in the Norwegian forms; the lateral margin is not ciliated, but on the broad end bearing the long terminal spine some 5 or 6 fine denticles are seen.

Length 1.9—2 mm.

Remarks. — This species is easily separated by the claws on the antennæ, the joints in the rami of first legs, the shape and denticulation of fifth legs, the short genital segment, and the two following very short segments.

Occurrence. — Not taken by the "Ingolf", but by two Danish collectors.

West Greenland: Egedesminde (Lat. 68°42' N.), Mag. sc. M. Levinsen; 3 females.

— — Godthaab (Lat. 64°11' N.), in fishing net, Captain Ryder; 3 females.

Thersitina Norman.

This genus is the only representative for the family Ergasilidæ found in our area, and it comprises as yet only a single valid species.

20. Thersitina Gasterostei Pagenst.

1861. *Thersites Gasterostei* Pagenstecker, Archiv f. Naturg. 1861, p. 118, Taf. VI, Fig. 1—9.

1863. *Ergasilus* — Krøyer, Nat. Tidsskr. 3 R. B. II, p. 307, Tab. XII, fig. 2, a—h.

1892. *Thersites gasterostei* Canu, Travaux Laborat. Wimereux-Ambleteuse, T. VI, p. 245, Pl. XXIII, fig. 13—18.

!1913. *Thersitina* — T. & A. Scott, Brit. Paras. Copep, p. 42, Pl. XXV, figs. 1—6; Pl. LI, fig. 6.

Occurrence. — Not taken by the "Ingolf". Krøyer recorded it from West Greenland and the Færoes; it is generally found in the branchial cavities of *Gasterosteus aculeatus*, most frequently on the inner surface of the gill-covers, sometimes also on the gills and rarely besides on the skin, especially on the pectoral fins (Krøyer; Canu).

Distribution. — On *Gasterosteus aculeatus* at Barra, Outer Hebrides, in the river Forth and at Aberdeen; on *Spinachia vulgaris* in Loch Etive, west coast of Scotland (T. & A. Scott). On *Gast. aculeatus* it has also been taken at Wimereux (Canu), at Ostende (Pagenstecker), in the Sound and in Flensborg Fjord (Krøyer).

Eunicicola Kurz.

On this genus, of which only a single species is known, G. O. Sars established in 1918 the new family Eunicicolidæ.

21. Eunicicola Clausi Kurz.

1877. *Eunicicola Clausi* Kurz, Sitzb. Akad. Wiss. Berlin, I, Jahrg. 1877, p. 1, Taf. I—II.

1898. *Eurynotus insolens* T. & A. Scott, Ann. Mag. Nat. Hist. Ser. 7, Vol. I, p. 188, Pl. X, fig. 17; Pl. XI, figs. 5—13.

!1918. *Eunicicola Clausi* G. O. Sars, Account, p. 204, Pl. CXIII.

The single specimen agrees on the whole with the figures given by Sars excepting in one point, viz. that the head is produced into a kind of transverse plate with the front margin straight and the lateral margins oblique, each lateral margin projecting from the head at a point a little before the end of the anterior margin of first joint of the antennula; this plate is considerably longer, more developed, than in Sars' figure of the animal seen from below. Each ovisac contains 6 eggs.

Occurrence. — Not taken by the "Ingolf", but by Dr. Th. Mortensen, June 20, 1899.

Færoes: 16 miles East to South off Nolsö, 80 fathoms; 1 female.

Distribution. — Recorded from Risör, south coast of Norway, about 50 fathoms, and from Christiania Fjord near Dröbak (G. O. Sars). Furthermore gathered in the Firth of Clyde (T. Scott) and at Triest, on *Eunice Claparèdi* (Kurz).

Selioides Levinsen.

This very interesting genus I refer to the Cyclopoidea, as it in various features is more related to this than to any of the following divisions. Only a single species is known.

22. *Selioides Bolbroei* Levinsen.

1877. *Selioides Bolbroei* Levinsen, Vidensk. Medd. Naturh. Foren. Kjøbenhavn for 1877, p. 353, Tab. VI, Fig. 5—11.

1886. — — H. J. Hansen, Dijnphna-Togetets zool.-bot. Udbytte, p. 261.

Levinsen's description (in Danish) is good, and his figures sufficient, but his interpretation of some of the appendages is wrong. What he describes as a plate-shaped part situated behind each mandible and equipped on the free margin with a minute, oblong-oval knot and three spines is in reality a protruding maxillula; a little more behind the two-jointed very robust maxillæ are seen, named maxillipeds by Levinsen. Furthermore he says that the abdomen has 3 pairs of limbs; what he names the abdomen is essentially the trunk, and what he considers to be the second pair of limbs is in reality the maxillipeds, which lie near the median line and in the female far more backwards than the first pair of thoracic legs, while in the male they are at least as far forwards as first legs, the latter pair being in the male articulated at the outer proximal angle of the maxillipeds. Already in 1886 I proposed this interpretation and besides pointed out the existence of three pairs of small, ventral and transverse chitinized thickenings, in all probability being the vestiges of the three posterior pairs of thoracic legs.

Occurrence. — Taken by the "Ingolf" at a single station.

Denmark Strait: Stat. 96: Lat. 65°24' N., Long. 29°00' W., 735 fathoms, temp. 1°2. 1 female, situated above one of the parapodia of *Harmothoë nodosa*.

At West Greenland this species has been taken at three places. It was gathered at Kekertak, Torssukatek's Ice-Fjord, 135—140 fath., on *Nychia cirrosa*, Aug. 31, 1870 by Dr. Öberg (Riks-Museum, Stockholm). At Egedesminde (Lat. 68°42' N.) it was discovered by Mag. sc. M. Levinsen on *Harmothoë imbricata*, and the majority of the considerable number of specimens was found in stomachs of *Cottus scorpio*. At Godthaab (Lat. 64°11' N.) a single juvenile female was secured by Capt. Ryder.

Distribution. — The Kara Sea, 65 fath., 1 female on *Harmothoë imbricata* (H. J. Hansen).

Division Monstrilloida.

Of this small but extremely interesting division only a single species has hitherto been found within the "Ingolf" area, but it may in all probability be possible in the future to gather a few forms near the Færoes and south of Iceland.

23. *Monstrilla Wandeli* Steph.

1913. *Monstrilla Wandeli* Stephensen, Meddel. fra Grønland B. LI, p. 73, Pl. VI.

As pointed out by Stephensen, this species is easily recognized by the reticulation on the cephalothorax together with the position of the dorsal small hair on each caudal ramus, and the shape of fifth legs, as each leg has a subcylindrical process or small and slender ramus on the inner side; this process reaches slightly beyond the base of the two terminal setæ and protrudes freely backwards, but it is in Stephensen's figure obliquely pressed against the peduncle.

Occurrence. — The only specimen known is Stephensen's type.

West Greenland: Northern Strömfjord, at Lat. 67°40' N., Long. 53° W., surface; 1 specimen.

Division Notodelphyoida.

Notodelphys Allman.

It is rather curious that only a single species of this genus has hitherto been found in the "Ingolf" area.

24. *Notodelphys rufescens* Thor.

1860. *Notodelphys rufescens* Thorell, K. Sv. Vet. Akad. Handl. B. 3, No. 8, p. 35, Tab. II, 2.

!1921. — — G. O. Sars, Account, Vol. VIII, p. 33, Pl. XVII, 1.

The single female agrees excellently with the descriptions and figures of Thorell and Sars excepting as to one point, viz. that the incubatory pouch is exceedingly large, in reality so long that the abdomen seems to originate from the middle of its ventral side, so that it, seen from above, covers the whole abdomen excepting its last segment. The caudal rami completely as figured by Thorell and Sars, consequently differing from *N. Allmani* in the position of the lateral seta.

Occurrence. — Not secured by the "Ingolf", but by Dr. Th. Mortensen in 1899.

Færoes: North of Nolsö. In *Phallusia conchilega*; 1 specimen.

Distribution. — South coast of Norway (G. O. Sars); Bohuslän (Thorell, Aurivillius).

Doropygopsis G. O. Sars.

This genus comprises only a single species.

25. *Doropygopsis longicauda* (? Aurivillius) G. O. Sars.

1883(?) *Doropygus longicauda* Aurivillius, Bidrag till Kännedomen om Krustaceer, som lefva hos Mollusker och Tunikater, p. 18, Taf. III.

!1921. *Doropygopsis longicauda* G. O. Sars, Account, Vol. VIII, p. 47, Pl. XXIII.

That the adult specimens enumerated below belong to *D. longicauda* as figured by Sars is easily seen; though the 4 specimens from *Boltenia* are very young and partly weakly chitinized, I am rather sure that they belong to the same species. But whether the species established by Aurivillius is the same as that described by Sars seems to be somewhat questionable. The antennulæ and antennæ in my specimens agree with Sars' figures, which in several respects differ so much from those drawn by Aurivillius (Pl. III, figs. 2 and 3) that

one may think that the animals drawn by the two authors can scarcely belong to the same species. The differences between the mandibular palp figured by them are also strong. But I am quite unable to settle the question on such differences, and can only point them out, adding, that if the animals belongs to different species that described by Sars must have another name. Supposing as a possibility that the figures in question drawn by Aurivillius are incorrect, I find it most practical to chose the way followed here out of the difficulty.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 27: Lat. $64^{\circ}54'$ N., Long. $55^{\circ}10'$ W., 393 fathoms, temp. $3^{\circ}8'$; 1 female, found in sifted bottom material.

Furthermore it has been taken at four other places in our area.

Egedesminde (Lat. $68^{\circ}42'$ N.), Mag. sc. Traustedt; 1 adult female in *Ascidia callosa*.

Davis Strait: Lat. $67^{\circ}34'$ N., Long. $55^{\circ}29'$ W., 53 fathoms, Admiral Wandel; 1 adult female in *Ascidia prunum*.

South-West Greenland, K. Stephensen, 1912; 4 very or extremely young females in *Boltenia echinata*.

North Iceland: Skagestrand, Steincke 1875; 10 females in the branchial cavity of *Phallusia* sp.

Distribution. — Different places at the south and west coasts of Norway; most of the specimens in the branchial cavity of *Phallusia obliqua* (G. O. Sars). Coast of Bohuslän (Aurivillius); Spitzbergen (Schellenberg).

26. *Doropygella Thorelli* Auriv.

1883. *Doropygus Thorelli* Aurivillius, Bidrag til Kännedomen om Krustaceer, som lefva hos Mollusker og Tunikater, p. 45, Tafl. V.

!1921. *Doropygella* — G. O. Sars, Account, Vol. VIII, p. 49, Pl. XXIV.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 28: Lat. $65^{\circ}14'$ N., Long. $55^{\circ}42'$ W., 420 fathoms, temp. $3^{\circ}5'$; 1 female in sifted bottom material.

Besides taken at two other places in the "Ingolf" area.

Færoes: Vestmanhavn, Mag. sc. R. Hörring, June 18, 1906; 2 females in *Phallusia obliqua*.

South-East of Iceland: Lat. $61^{\circ}49'$ N., Long. $14^{\circ}11'$ W. "Thor" (Dr. Joh. Schmidt), 800 m. wire out; 4 females in *Phallusia obliqua*.

Distribution. — Several places at the south and west coasts of Norway, generally within the branchial cavity of *Phallusia obliqua*, "more rarely in that of the other kinds of Ascidians" (G. O. Sars). Coast of Bohuslän, in *Ph. mentula* (Aurivillius).

Buprorus Thorell.

A single species of this interesting genus is found in our area.

27. *Buprorus Loveni* Thorell.

1860. *Buprorus Loveni* Thorell, K. Sv. Vet. Akad. Handl. B. 3, No. 8, p. 63, Tab. X, 14

!1921. — — G. O. Sars, Account, Vol. VIII, p. 62, Pl. XXX.

Occurrence. — Not secured by the "Ingolf", but by Mag. sc. R. Hörring, June 18, 1906.

Færoes: Vestmanhavn; 2 females in *Phallusia obliqua*.

Distribution. — Norway, "within the branchial cavity of different kinds of Ascidians, most frequently in *Phallusia obliqua* (G. O. Sars). Bohuslän, in *Phallusia mentula* and *P. aspersa* (Thorell).

Blakeanus Wilson.

Of this genus, established by C. B. Wilson in 1921, a species considered as new has been found in our area.

28. *Blakeanus groenlandicus* n. sp.

(Pl. II, figs. 8 a—8 d; Pl. III, figs. 1 a—1 h.)

Female. — The body, excepting the abdomen, very thick and dorsally extremely inflated (fig. 1 a), highest above fourth thoracic legs and not divided into segments. Abdomen consists of five distinct segments; the caudal rami (fig. 1 h) are thick, and each with 4 terminal, more or less curved and hook-shaped, robust spines, the upper one nearly twice as long as the others.

Antennulæ (fig. 1 b) rather similar to those in *Botryllophilus macropus* Canu; first joint is much broader than long, along the distal margin with 6 very long and robust setæ, and a little from the inner end a protuberance with 3 strong setæ very different in length, finally at the outer angle a spiniform seta not half as long as the others; the remainder of the antennula consists of three joints. — Antennæ (fig. 8 a) slender; the terminal joint has 2 lateral setæ, 3 terminal setæ, and above at the end a minute spine; near to this spine an oblique comb of minute spines is observed. — Mandibles (fig. 1 c) in the main as in *B. macropus*; the distal third of the cutting edge (fig. 1 d) with 7 more or less spiniform processes very different in size, while the proximal two-thirds of the edge is a most elegant comb of innumerable, very slender spines; the broad palp is curved two times in opposite directions and exhibits no articulations, but both the endopod and the exopod has respectively 5 and 4 robust or extremely robust terminal setæ. — Maxillulæ (fig. 8 b), maxillæ (fig. 8 c) and maxillipeds (fig. 8 d) show on the whole close relationship to *Botryll. macropus*; special description is scarcely needed. — The four anterior pairs of legs increase in length from first (fig. 1 e) to fourth pair (fig. 1 f); the sympod is thick; the endopod is short, two-jointed, with first joint very short and second joint with respectively 5 and 4 terminal setæ; the exopod, which is scarcely distinctly jointed, is twice, or considerably more than twice, as long as the endopod, on first pair with 5 strong setæ on the end and along one margin, while on fourth pair only a strong, terminal, spiniform seta and 4 quite small spiniform setæ (fig. 1 g) — Fifth legs (fig. 1 a) very different from those in *Botryllophilus*, but similar to those in *Blakeanus corniger* Wils., as the proximal part is much thickened, the distal part slender and much curved, with a minute hair at the end.

Length 4.1 mm.

Remarks. — The present species is so similar to Wilson's figure of his *Blakeanus corniger* (described in 1921 from a specimen taken "from an Ascidian, "Cynthia carnea", in Long Island Sound") that I should have considered the forms as identical, if Wilson had not stated on the caudal rami that "they are entirely

destitute of setæ"; besides his figures of antennula, antenna and fourth leg show some differences, which scarcely can be due to variation or incorrect drawing.

The new species exhibits rather close relationship to *Botryllophilus macropus* Canu in the structure of antennulæ, antennæ, mandibles, maxillulæ, maxillipeds and caudal rami, but the thoracic legs are more reduced and the fifth pair very different. If the genus *Blakeanus* shall be maintained, the essential differences are the extraordinary inflation of the cephalothorax and the shape of fifth legs; the differences in all other appendages are scarcely of generic value, as f. inst. the two species of *Botryllophilus*, *B. macropus* Canu and *B. brevipes* G. O. S. show many differences from one another in the appendages. It may be added that when Wilson says that his animal "can not be located in any of the existing families" of the group Notodelphyoida, be based his conclusion on the assumption that nothing corresponding to the "curved horns" is known in any other Copepod — though these horns are in reality only the fifth pair of thoracic legs, which in *Botryllophilus* have a similar position, but are generally somewhat less altered.

Occurrence. — Not taken by the "Ingolf" but many years ago by Mag. sc. M. Levinsen.

West Greenland, probably Egedesminde. In *Cynthia rustica*, 2 females (one among them unfortunately lost).

Botryllophilus Hesse.

Of this remarkable genus a single new species has been secured in the "Ingolf" area.

29. *Botryllophilus inæquipes* n. sp.

(Pl. III, figs. 2 a—2 f.)

Female. — This species is similar to *B. brevipes* G. O. S. and agrees with it in most particulars. Thus it may scarcely be possible to point out specific differences between them in antennulæ (fig. 2 a), antennæ (fig. 2 b), mandibles (fig. 2 c), maxillæ, maxillipeds, fifth pair of legs, or in the abdomen with its furcal rami, each terminating in 4 curved claws. But *B. inæquipes* differs from *B. brevipes* Sars and agrees with *B. ruber* (?Hesse), T. Scott in having the thoracic segments distinctly marked off from each other, and it differs sharply from *B. brevipes* in the structure of first to fourth pairs of thoracic legs. Sars says as to these legs in his *B. brevipes* that they are "much reduced, with both rami quite short and uniarticulate", but in *B. inæquipes* the exopod is uniarticulate, the endopod 2-jointed in the two anterior pairs, while in third and fourth pairs both rami are 2-jointed. In *B. inæquipes* first leg (fig. 2 d) has 8 strong and long setæ on the second joint and a single seta on the outer margin of first joint of the endopod, while the exopod is oblong and somewhat triangular, with 5 spines on the outer margin. Fourth legs are very characteristic especially in the fact, that the two legs of this pair differ from one another; the right leg (fig. 2 e) has the endopod considerably longer than the exopod and equipped with in all 5 partly long setæ, one among them on the inner margin of the proximal joint, and this joint is considerably longer than the second; the exopod has 4 spines, viz. one long and strong spine at the end, one spine on the inner margin, and two spines rather remote from one another on the outer margin. In the left leg (fig. 2 f) the 5 setæ on the endopod are much longer than those on the right leg and distally very thin, furthermore the endopod is turned in a curious way so that it, when the leg is seen from below (from in front), has the real inner margin directed forwards and even somewhat

outwards; the exopod is as long as the endopod, oblong-triangular, with a subterminal long and somewhat slender spine, on the distal half of the outer margin with 2 spines, the distal one quite small, and it has no spine on the inner margin. Second and third pairs of legs do not exhibit any, at least not any marked, asymmetry, and are on the whole more similar to first than to fourth pair, though the setæ and spines on the rami are on second pair a little, on third pair more, reduced in number.

Length 1.44—1.6 mm.

Remarks. — The asymmetry in the fourth pair of legs is found not only in the specimen partly dissected but also in the two other specimens; especially the differences in the shape and equipment with spines on the exopod of the two legs is very conspicuous. Whether a similar structure exists in any other species is unknown,¹ but, as pointed out above, *B. inæquipes* is besides easily separated from *B. brevipes* Sars and *B. ruber* as figured by Scott by the jointing of the rami of the legs.

Occurrence. — In sifted mud from two "Ingolf" stations.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fathoms, temp. 3°9; 2 females.

— — Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fathoms, temp. 1°5; 1 female.

As even 3 specimens have been discovered in sifted bottom material the form cannot be rare in the Davis Strait, but whether the specimen found in mud from 1435 fath. really originates from that depth may still be a little uncertain.

Schizoproctus Auriv.

This interesting genus comprises hitherto only a single species.

30. *Schizoproctus inflatus* Auriv.

1885. *Schizoproctus inflatus* Aurivillius, Vega-Expedit. vetenskapl. Iakttagelser, B. IV, p. 248, Tafl. 9, Fig. 21—32.

1921. — — G. O. Sars, Account, Vol. VIII, p. 72. Pl. XXXIV.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 28: Lat. 65°14' N., Long. 55°42' W., 420 fathoms, temp. 3°5; 1 specimen, in sifted bottom material.

This species does not seem to be rare at West Greenland. Mag. sc. M. Levinsen has taken it two times in *Ascidia* sp., probably at Egedesminde (Lat. 68°42' N.); the Copenhagen Museum possesses one specimen from *Molgula groenlandica* and 3 large specimens taken in *Boltenia bolteni*, in both cases from West Greenland but without special locality. Besides our Museum possesses a specimen taken by Dr. Vanhöffen in Lille Karajak Fjord (at Lat. 70°20' N.) and presented under the name *Doropygus gibber* Thorell, a wrong determination also given in his list (1897) of his Crustacea from Greenland.

Finally this species has been gathered by the IIInd Amdrup-Expedition at a single place.

East Greenland: Lat. 67°14' N., at the beach, rocky bottom with algæ, July 24, 1899; 1 adult female.

¹ After this part of my manuscript was finished, Cand. mag. K. Stephensen directed my attention to Schellenberg's paper "Neue Notodelphyiden" published in August 1922 (Mitth. Zool. Mus. Berlin, 10 B. 2) in which that author points out (p. 282—86) asymmetry of different degree in the exopod of the thoracic legs in several species.

Distribution. — At Vadsö, eastern Finmark, about 60 fath., in *Phallusia obliqua* (G. O. Sars); in Navit Fjord, Finmark, 15—30 fath., in *Phallusia mentula*, and at Spitzbergen, in *Phallusia* sp. (Aurivillius). In all cases the animals were found in the branchial cavity.

Enterocola v. Beneden.

Of this interesting genus only a single species has been found in our area.

31. *Enterocola setifera* n. sp.

(Pl. III, figs. 3 a—3 i.)

Female. — Seen from below rather similar to *E. fulgens* v. Ben. as figured by Canu (1892), but differs especially in antennulæ, antennæ, the shape and armature of the endopod of the four anterior pairs of thoracic legs, and in the equipment with setæ of fifth legs.

The antennulæ (fig. 3 a) are very oblong-triangular, 4-jointed, as the distal two-fifths show three rather distinct articulations, but the proximal part exhibits vestiges of a few rudimentary articulations; the whole anterior margin is equipped with a number of strong, nearly spiniform setæ, and the end bears some fine setæ. — Antennæ (fig. 3 b) 3-jointed; the two proximal joints thick, and the first joint has at its front angle a small protuberance terminating in a somewhat short, very thick seta which is broad to the obtuse end; terminal joint moderately slender with a strong, curved spine and a couple of small setæ on the end. — Maxillulæ (? or maxillæ) with the distal lobe well developed; its terminal margin (fig. 3 c) is convex and behind the middle with an incision, in which is seen a somewhat protruding piece as a kind of joint and terminating in 4 strong spines, while the margin of the lobe itself has 6 spines, 4 of which in front of the "joint". — Maxillipeds (figs. 3 d and 3 e) very thick; the terminal joint is bent inwards and has 3 robust spines on the end; on the inner side of the maxilliped is found a proximal, small, slender and protruding lobe terminating in 2 spines.

The four anterior pairs of legs subsimilar in structure; each pair with a narrow median piece between the two sympods (fig. 3 g). First pair considerably more narrow than the second, while the third is distinctly broader than the second and a little less broad than the fourth (fig. 3 g). In all pairs the endopod is a rounded plate, in first pair (fig. 3 f) more than twice as long as broad, in second pair somewhat and in fourth pair slightly, longer than broad; the broadly rounded end has on first pair two moderately large spines not tapering to the rounded end, and besides a third much shorter and thinner spine of similar shape; in fourth pair (fig. 3 g) the two terminal spines are much smaller than on first pair, while the third spine is wanting; second and third pairs of legs as to spines intermediate between first and fourth pair. Exopod in all pairs oblong-triangular, with the end acute and bearing a minute, thick spine. — Fifth pair, which originates on the anterior free margin of the plate covering the eggs, is a small, oblong piece with some setæ (fig. 3 h) towards the end; two among these setæ are extremely long, and the longest one reaches even nearly beyond the posterior margin of the covering plate. It may be added that about at the middle of the posterior margin of this plate a conspicuous seta is observed.

The caudal rami (fig. 3 i) are very oblong, with a few short setæ on the rounded end.

Length 2.9 mm.

Remarks. — The single specimen was discovered in sifted bottom material. The species is easily recognized by the shape of the spines on the endopods of the four anterior pairs of legs and the quite narrow plate between their sympods. The equipment with setæ on fifth pair is interesting; one may be tempted to suppose that these setæ act as the peculiar stiff setæ found on the epipod of first maxillipeds in nearly all Cumacea, viz. producing a movement in the water in the incubatory pouch. Antennulæ and antennæ differ considerably from those in *E. fulgens* v. Beneden, *E. betencourti* Canu or *E. bilamellata* G. O. S. My representation of the mouth-parts — excepting the maxillipeds — is imperfect, as I have only a single specimen and did not wish to sacrifice both sides of its head for an investigation which even might be partly unsuccessful. Judging from spines of the mouth-parts in situ I am, however, nearly sure that two pairs exist in front of the maxillipeds, the first pair being extremely small.

Occurrence. — Taken in sifted bottom material procured by the "Ingolf" at a single station.

South-West of Iceland: Stat. 81: Lat. $61^{\circ}44'$ N., Long. $27^{\circ}00'$ W., 485 fathoms, temp. $6^{\circ}1$; 1 female.

Division Caligoida.

Family Caligidæ.

Caligus O. F. Müller.

Only two species of this rich genus have hitherto been discovered in the "Ingolf" area.

32. *Caligus curtus* O. F. Müller.

1785. *Caligus curtus* O. F. Müller, Entomostraca, p. 130, Tab. XXI, fig. 1.
 1837. — — Kröyer, Naturh. Tidsskr. 1. Række B. I, p. 619, Tab. VI, fig. 2.
 1863. — — Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 180.
 1863. — *Æglefini* Kröyer, ibid. p. 163, 181, Tab. VII, fig. 3, a—f.
 1905. — *curtus* Wilson, Proc. U. S. Nat. Mus., Vol. XXVIII, p. 578, Pl. X, figs. 112—124; figs. 8, 24, and 28 in text. [With the earlier, rather intricate synonymy].
 1913. — — T. & A. Scott, Brit. Paras. Cop. p. 45, Pl. XXIV, figs. 1—2; Pl. XXV, figs. 7—9.

Occurrence. — Not taken by the "Ingolf", but by numerous collectors.

C. curtus has only been secured two times at West Greenland, viz. between Ritenbenk (Lat. $69^{\circ}44'$ N.) and Straumsnæs, on *Gadus* sp. (Olrik), and Pfaff captured it on *Gadus callarias* at Greenland; the locality is not given, but it was probably not far from Ritenbenk. It is not known from East Greenland.

At Iceland and the Færoes this species has been gathered many times and on various fishes, as *Gadus callarias*, *Gadus æglefinus*, *Molva byrkelange*, *Hippoglossus vulgaris*. Thus at North-West Iceland it has been captured in Önundarfjord, at North Iceland in Öfjord (or Skagestrand Bugt), at East Iceland near Hjeradsfloi, at South Iceland in Lat. $63^{\circ}26\frac{1}{2}'$ N., Long. $16\frac{1}{2}^{\circ}$ W., 62 fath., at South-West Iceland in Grindavik and Havnefjord. — At the Færoes it is evidently common; f. inst. it has been taken at Thorshavn, Strömö; somewhat east of the Færoes, at Lat. $62^{\circ}30'$ N., Long. $5^{\circ}14'$ W., 249 fath., it was taken on *Molva byrkelange*.

Distribution. — The Copenhagen Museum possesses specimens taken at various places in the North Sea on *Gadus callarias*, *Gadus virens* and *Molva byrkelange*; at Denmark it has been secured in the northern part of the Sound. Olsson mentions it as found on 11 species of fishes in Kattegat, Skagerak and off West Norway at Lat. 63° N.; T. & A. Scott say that it "is a common form around our shores"; v. Beneden records it from Belgium; Wilson has seen large numbers from "the eastern sea-board of the New England States of North America".

33. *Caligus rapax* H. Milne-Edw.

1840. *Caligus rapax* H. Milne Edwards, Hist. Nat. Crust. T. III, p. 453, Pl. XXXVIII, fig. 9—12.
 1861. — — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter, 5. Række, naturh. og math. Afd. B. 5, p. 359, Tab. II, fig. 4.
 1863. — *Lumphi* Krøyer, Naturh. Tidsskr. 3. R. B. II, p. 147, 177, Tab. II, fig. 2, a—f.
 1905. — *rapax* Wilson, Proc. U. S. Nat. Mus. Vol. XXVIII, p. 568, Pl. VII, figs. 79—89, and figs. 3, 7, 9, 10, 18, 22, 23, 26, 32, 36, 46—50 in the text.
 1912. — — Brian, Résultats Camp. Scient. par Albert I, Prince de Monaco, Fasc. XXXVIII, p. 5, Pl. VI, fig. 1—4.
 1913. — — T. & A. Scott, Brit. Paras. Copep. p. 48, Pl. IV, figs. 3—8, Pl. VI, figs. 1—2.

The extensive and very intricate synonymy is given by Wilson and Brian; discussions on the earlier literature especially by Krøyer (op. cit. p. 145) and Steenstrup & Lütken.

Occurrence. — Taken by the "Ingolf" at a single place.

North-West Iceland: Dyrefjord, on the skin of *Cyclopterus lumpus*; 1 female.

This species has not been discovered at West Greenland; at East Greenland it has been taken in Hekla Havn (Lat. 70°27' N.), living on *Gymnacanthus tricuspis* captured at about 6 fath. (Ryder Exped.).

At or around Iceland *C. rapax* is not uncommon. The Copenhagen Museum possesses a good number of females secured at Iceland by Hallgrímsson, determined and mentioned by Krøyer of *C. Lumphi*, certainly his co-types. At North-West Iceland a female was taken on *Hippoglossus vulgaris* in Önundarfjord by Mag. sc. W. Lundbeck. Dr. J. Schmidt (the "Thor") captured specimens in pelagic hauls in 1904 at the following 6 localities around Iceland.

- | | | | | | |
|------------|-------------|-----------------|------------------|------------|---|
| North | of Iceland: | Lat. 66°19' N., | Long. 23°27' W., | 115 m.; | 4 adults and 1 immature specimen. |
| West | - — | Lat. 64°16' N., | Long. 22°13' W., | 46 m., | 50 m. wire out; 2 males. |
| — | - — | Lat. 64°05' N., | Long. 22°40' W., | 40 m.; | 3 males. |
| South-West | - — | Lat. 63°29' N., | Long. 21°25' W., | 94—120 m., | 110 m. wire out; 2 females and 3 males. |
| — | - — | Lat. 63°18' N., | Long. 21°31' W., | 178 m.; | 1 female. |
| — | - — | Lat. 63°20' N., | Long. 20°49' W., | 124 m.; | 16 females, 11 males. |

At the Færoes *C. rapax* has been taken at Thorshavn, Strömö (Caroc) and somewhat east of the Islands in 230 fath. (Cand. mag. Ad. Jensen), in both cases on *Gadus callarias*.

Distribution. — According to various authors this species is common at Great Britain and Ire-

land, not only parasitic on various fishes, but also rather frequently among plankton material. It is known from Bohuslän (Steenstrup & Lüttken), from Kattegat and the western coast of Jutland (Krøyer), and has not unfrequently been taken by pelagic hauls in Skager Rak and the Kattegat (Björck). Brian records it from the Atlantic at Lat. $47^{\circ}46'$ N., Long. $5^{\circ}40'$ W., 132 m., on *Raja*, and from off Calvi, on *Siphonostoma rotundatum*; he says besides that it is common in the Mediterranean. It must be very common at the Atlantic coasts of the United States, as Wilson records it as taken on 25 species of fishes.

Lepeophtheirus Nordm.

Of this large genus 4 species have been found in our area.

34. *Lepeophtheirus pectoralis* O. F. Müll.

1776. *Lernæa pectoralis* O. F. Müller, Zool. Danicæ Prodrömus, p. 227.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 41, Tab. XXXIII, fig. 7.
 1837—38. *Caligus* — Krøyer, Naturh. Tidsskr. B. I, Tab. VI, fig. 4; B. II, p. 8.
 1863. *Lepeophtheirus* — Krøyer, Natur. Tidsskr. 3. Række, B. II, p. 215.
 1913. — — T. & A. Scott, Brit. Paras. Copep., p. 64, Pl. X, figs. 3—4; Pl. XII, figs. 2—3; Pls. XIII, XIV, XV; Pl. XVI, figs. 1—3. [With synonymy.]

Occurrence. — Secured by the "Ingolf" at two localities.

North-West Iceland: Isafjord, on the inner side of the pectoral fins of *Pleuronectes limanda*; 3 specimens.

— — Dyrefjord, on the skin of *Anarrhichas lupus*.

This species has never been found at Greenland, but it has been secured several times by various collectors at Iceland on *Pleuronectes platessa*, *Pl. limanda*, *Hippoglossus vulgaris* and *Gadus æglefinus*, a single time and probably incidentally on *Asterias rubens* (Mag. sc. W. Lundbeck). The localities are: at North-West Iceland in Skutulsfjord, Önundarfjord and Dyrefjord, at West Iceland in Faxefjord, at South-West Iceland in Havnefjord, finally south of Iceland.

At the Færoes it has been gathered in Thorshavn on the fins of *Pleur. platessa* by Dr. A. C. Johansen.

Distribution. — Firths of Forth and Clyde, Irish Sea, Belfast, and Plymouth (according to T. & A. Scott). At Bohuslän it was found on *Pleuronectes flesus*, and in Skager Rak on *Raja radiata* (Olsson). At Denmark very common, especially on the pectorals fins of various flounders (Krøyer).

35. *Lepeophtheirus Hippoglossi* Kr.

(Pl. III, figs. 4 a—4 b.)

1837. *Caligus Hippoglossi* Krøyer, Naturh. Tidsskr. 1. Række, B. I, p. 625, Tab. VI, fig. 3.
 1863. *Lepeophtheirus* — Krøyer, Naturh. Tidsskr. 3. Række, B. II, p. 205, Tab. VI, fig. 5, a-d.
 — — *robustus* Krøyer, ibid. p. 209, Tab. VI, fig. 6, a—c.
 1905. — *hippoglossi* Wilson, Proc. U. S. Nat. Mus. Vol. XXVIII, p. 625, Pl. XX, figs. 234—243; fig. 6 in the text.
 1913. — — T. & A. Scott, Brit. Paras. Copep. p. 67, Pl. VI, figs. 4—5; Pl. XVII, fig. 2; Pl. XVIII, figs. 8—10.

Kröyer established his *L. robustus* on a couple of specimens taken on a *Raja* from West Greenland, and he described them as males. Wilson accepts *L. robustus*, gives a rearranged translation of Kröyer's description, and adds that it "seems fairly well characterized by the skin protuberances on the genital segment and by the bipartite furca" (p. 647). I have examined Kröyer's types and besides looked over a good number of immature specimens of *Lepeophtheirus Hippoglossi* taken together with a multitude of adult specimens of both sexes. The result is that *L. robustus* has not been established on males but on young specimens of *L. Hippoglossi*. The bipartite furca is well known as one of the good characters for the last-named species. Fig. 4 b represents the posterior part of the body of a very young *L. Hippoglossi*, 5 mm. long (caudal rami included), and fig. 4 a the same part of a specimen 8 mm. long. Both figures show that the lateral part of the genital segment is produced backwards into a triangular protuberance about as long as broad and equipped with 4 setæ; T. & A. Scott have already drawn an immature female (Pl. XVII, fig. 2) showing the same shape of the genital segment, nearly as in my fig. 4 a). In an older, immature specimen, 11 mm. long, these protuberances are much shorter, much broader than long and distally broadly rounded with a single minute seta. Furthermore my fig. 4 a exhibits the curious skin-lappets at the base of the genital segment, on each side two lappets, the anterior one partly overlapping the other; in the youngest specimen (fig. 4 b) the posterior lappet is proportionately a little larger and especially thicker and more developed as a protuberance, while the anterior lappet is a small branch of the other. In this young stage the protuberances look as if they were the lateral part of an otherwise not defined segment intercalated between the segment bearing the fourth pair of legs and the genital segment. In the above-named specimen 11 mm. long the lappets have disappeared completely.

Occurrence. — Not taken by the "Ingolf".

At West Greenland *L. Hippoglossi* seems to be more common than any other among the parasitic Copepoda; it is generally found on *Hippoglossus vulgaris* and *Hipp. pinguis*, but has also been taken on *Raja* sp. (Kröyer). It has been taken many times along the coast from near Ritenbenk, at Lat. 69°44' N., southwards to Holstensborg, at Lat. 66°56' N., thus at Godhavn, at Egedesminde, etc.; no specimens taken at any place between Holstensborg and Cape Farewell are to hand, but as several tubes with animals marked Greenland without special locality are preserved in the Copenhagen Museum, some among the parasites may originate from places in that more southern coast. — At East Greenland it has not been discovered.

At Iceland the present species has been captured rather frequently, but in several cases no special locality has been noted; it was found on both species of *Hippoglossus*, besides on *Somniosus microcephalus*; Hallas (1867) found it even on the retina of that shark. At North-West Iceland it was gathered in Adalvík and Önundarfjörd (Mag. sc. W. Lundbeck), furthermore at Lat. 66°10' N., Long. 24°42' W., 98 m., on the blind side of *Hippoglossus vulgaris*, 1 female (Dr. Joh. Schmidt). South of Ireland, at Lat. 63°05' N., Long. 20°00' W., 920 m., a female was taken on the side of *Centrophorus squamosus* (Dr. Joh. Schmidt).

At the Færoes *L. Hippoglossi* has been found several times by various collectors; somewhat east of these islands, at Lat. 62°30' N., Long. 5°10' W., 249 fath., numerous specimens were taken on *Hippogl. vulgaris* (Cand. mag. Ad. Jensen).

Distribution. — Various places in Great Britain from Shetland to Cornwall (various authors);

Belgium (v. Beneden). The Copenhagen Museum possesses specimens from the west coast of Norway, from Skagerak, and Krøyer mentions it from Kattegat. Wilson records it from Cape Ann, Mass.; but when Brian (1898) records it from Pegli (Liguria) on *Orthogoriscus mola*, the determination is probably wrong.

36. *Lepeophtheirus Thompsoni* Baird.

1850. *Lepeophtheirus thompsoni* Baird, Nat. Hist. Brit. Entom., p. 278, Pl. XXX, fig. 2.
 1861. *Caligus branchialis* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter, 5. Række, naturh. og math. Afd. B. 5, p. 362, Tab. II, fig. 3.
 1863. *Lepeophtheirus Rhombi* Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 192, Tab. V, fig. 5, a—i.
 — — *gibbus* Krøyer, ibid. p. 195, Tab. XVII, fig. 2, a—i.
 — — *gracilescens* Krøyer, ibid. p. 198, Tab. VI, fig. 2, a—i.
 !1905. — *thompsoni* Wilson, Proc. U. S. Nat. Mus. Vol. XXXVIII, p. 619, Pl. XVIII, figs. 212—219.
 !1913. — — T. & A. Scott, Brit. Paras. Copep. p. 69, Pl. XVII, fig. 3; Pl. XXV, fig. 10; Pl. XLVIII, figs. 1—3.

Wilson gives the full synonymy with discussion, and he is probably right in his interpretations. — Scott describes the ramus of fourth legs as three-jointed, which is correct, but in his fig. 3 on Pl. XVII and fig. 3 on Pl. XLVIII the ramus is only two-jointed.

Occurrence. — Not taken by the "Ingolf".

Færoes. Taken on *Hippoglossus vulgaris* in 1863 by Sysselmand Müller; 11 females, 5 males.

Distribution. — On the gills of *Rhombus maximus* at various places in the British Islands from southern Scotland to Plymouth and Cornwall (various authors). Krøyer mentions it as taken on *Rhombus maximus* and *R. lævis* both from Kattegat and the North Sea, probably the west coast of Jutland; Steenstrup & Lütken received it from Bohuslän, where it has been found by Malm and Olsson. Wilson mentions a specimen taken in Woods Hole, Mass., and a specimen from the mouth of *Cynoscion nobilis* captured at La Jolla, California.

37. *Lepeophtheirus Salmonis* Kr.

- 1837—38. *Caligus Salmonis* Krøyer, Nat. Tidsskr. B. I, Tab. VI, fig. 7, a—e; B. II, p. 13.
 1863. *Lepeophtheirus* — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 211, Tab. XVII, fig. 1, a-b.
 !1905. — *salmonis* Wilson, Proc. U. S. Nat. Mus. Vol. XXVIII, p. 640, Pl. XXIV, figs. 294—303.
 !1913. — — T. & A. Scott, Brit. Paras. Copep. p. 71, Pl. XVII, fig. 4; Pl. XVIII, figs. 11—12.

Occurrence. — Not taken by the "Ingolf".

The Copenhagen Museum possesses 2 old specimens marked Greenland, consequently West Greenland, "Skjællax", consequently *Salmo salar*.

At West Iceland this species has been gathered at Hvítá in Borgarfjord on *Salmo trutta* by Mag. sc. B. Sæmundsson; 12 females, 1 male.

Distribution. — Taken at a number of places around the British Islands on forms of *Salmo*, chiefly on *S. salar* (T. & A. Scott). Krøyer records it as rather common on *Salmo salar* at Denmark; Olsson mentions it from Norway.

Wilson records the species from New Foundland, Labrador, and Maine; besides from the Pacific coasts of America as found on various Salmonidæ at Alaska, at Monterey in California, etc.

Trebius Krøyer.

Of this genus only the single form from northern Europe has been found in the "Ingolf" area.

38. *Trebius caudatus* Krøyer.

1838. *Trebius caudatus* Krøyer, Nat. Tidsskr. B. II, p. 30, Tab. I, fig. 4.

1863. — — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 223, Tab. X, fig. 1, a—k.

!1907. — — Wilson, Proc. U. S. Nat. Mus. Vol. XXXI, p. 681, Pl. XV, figs. 11—13; Pl. XVI
figs. 14—22; fig. 1 in the text.

!1913. — — T. & A. Scott, Brit. Paras. Copep. p. 81, Pl. XXII, fig. 1—2; Pl. LIV, figs. 1—11.

Scott commits a somewhat misleading error in the drawings of female and male (figs. 1 and 2 on Pl. XXII) in not marking off from the carapace the third segment, which is free; furthermore the genital segment on the male seen from above has the rudimentary legs on the dorsal surface, which is wrong, as they are placed on the ventral surface and not visible from above.

Occurrence. — Not taken by the "Ingolf".

It is not known from Greenland or the Færoes. At Iceland it has been gathered at three places, viz. at North Iceland in Skagestrand Bay, 50 fath., 1 female (Steincke); at South-West Iceland in Grindavik on *Raja batis*, 18 females and 1 male (Mag. sc. B. Sæmundsson); finally off South Iceland at Vestman-Öerne, on the head and back of *Raja batis*, 34 females, 6 males (Mag. sc. R. Hörring).

Distribution. — T. & A. Scott write: "Parasitic on skates, rays, dogfishes, etc." and they put together localities from Scotland, the Irish Sea and South England. Krøyer records it from the northern Kattegat on *Galeus canis*; Olsson from Skagerak and Storeggen (West of Norway) on *Raja batis* and once on *Raja fullonica*. It is not known from the Atlantic coast of Amerika.

Dinematura Latr.

Of this fine genus 2 species occur within our area. — With most Zoologists I prefer the name *Dinematura*, an amelioration by Burmeister of the earlier *Dinemoura* or *Dinemura*.

39. *Dinematura ferox* Kr.

(Pl. III, figs. 5 a—5 g.)

1838. *Dinematura ferox* Krøyer, Nat. Tidsskr. B. II, p. 40, Tab. I, fig. 5.

!1861. — — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter 5. Række, naturh. og math. Afd.
B. 5, p. 376—77, Tab. VII, fig. 14.

!1907. — — Wilson, Proc. U. S. Nat. Mus. Vol. XXXIII, p. 377, Pl. XXII, figs. 70—78.

The numerous figures of the females of *D. ferox* Kr. and *D. producta* Müll. given by Steenstrup & Lütken and by Wilson have made these animals on the whole well known. Though *D. ferox* is rather common in the "Ingolf" area and *D. producta* not rare in the North Atlantic the males have hitherto been undiscovered. In our Zoological Museum I found a male determined (probably by Lütken) as *D. ferox* and sent down from Greenland in 1864; besides the "Thor" captured a specimen off Iceland in 1903, and this is the type for my figures.

The type is 18 mm. long in the median line; the other specimen is 19 mm. The carapace (fig. 5 a) is nearly circular in outline, only a little broader than long when measured to the end of the posterior corners; each postero-lateral produced part is nearly triangular and reaches, not including its marginal lamella, to the posterior margin of the second free segment. The third free thoracic segment is a little longer than the second; it is expanded on the sides, with the lateral margins strongly but somewhat irregularly convex, and it has, in contradistinction to the male of *D. latifolia* Stp. & Ltk., no trace of any plate-shaped expansion above the anterior angles of the following segment. This, the genital segment, is somewhat longer than broad, with the lateral margins a little and regularly convex; the surface has two long, longitudinal impressions. Behind the genital segment two segments are found; the first small with the lateral margins convex or even angular; the terminal segment is much larger, distinctly broader than long, with the posterior margin very convex. — Each caudal ramus nearly longer than the two posterior segments combined, nearly twice, or more than twice, as long as broad, with 3 pubescent setæ on the posterior margin, and a shorter seta on the outer margin somewhat before the end.

The appendages, excepting antennæ and fourth legs, nearly as in the female. The terminal hook of the antennæ (fig. 5 c) has its distal third somewhat feebly curved, as in the female, while it is much more curved in the female *D. producta*; the hook differs from that of the female in having a moderately long, very robust and much recurved secondary claw at the end of its first third. — The maxillulæ (fig. 5 d) as in the female; they differ from those in the female *D. producta* in the shape of first joint and in the relative length of the two other joints; first joint has a short, somewhat thick exopod terminating in two slender and short rami, and each of them with a minute terminal spine. — The maxillæ (fig. 5 e) as in the female; fig. 5 f shows the armature of the curious lateral, thin-skinned process, and besides how the long, terminal, soft part is equipped with numerous minute, sharp prickles, most of them arranged in lines. — The maxillipeds (fig. 5 g) have the distal inner part of the very thick first joint adorned with knots as in the female, but partly less produced; second joint about as long as thick, while the real claw is long as in the female, considerably longer than in the female of *D. producta*. — The three anterior pairs of natatory legs as in the female. Fourth legs, which in the female have both rami lamellar, unjointed and without setæ or spines, are in the male somewhat small, with both rami biarticulated and equipped with spines and pubescent setæ, as also — according to Wilson — is the case in the male of *D. latifolia*.

Occurrence. — Not taken by the "Ingolf".

It has been gathered several times at northern West Greenland, viz. at Umanak (Lat. 70°42' N.), Ikerasak (ab. Lat. 70°30' N.), Ritenbenk (Lat. 69°44' N.), Jakobshavn (Lat. 69°13' N.) and Egedesminde (Lat. 68°42' N.); Miers recorded it from Hare Isl. (ab. Lat. 70°25' N.) and Umanak. Furthermore it has

been secured at North-West Iceland, especially in Dyrefjord; at the Færoes it has been taken three times. In some cases the name of the host is not given, in other cases the host was *Somniosus microcephalus*; in a few cases it is only said that it was found on a shark, which probably always has been the species named. The male specimen taken as type was captured south of Iceland: Lat. $63^{\circ}05' N.$, Long. $20^{\circ}00' W.$, 920 m., on *Centrophorus squamosus* (Dr. Joh. Schmidt).

Distribution. — *D. ferox* was secured at Hammerfest, Finmark (M. Sars), but has not yet been found at Great Britain or the Atlantic coast of America. Whether it is identical with *D. carcharodonti* Thompson (1889) from New Zealand, as suggested by Bassett-Smith and Wilson, seems to me somewhat doubtful.

40. *Dinematura producta* Müll.

1785. *Caligus productus* O. F. Müller, Entomotraca, p. 132, Tab. XXI, fig. 3—4.
 !1861. *Dinematura producta* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter, 5. Række, naturh. og math. Afd. B. 5, p. 370—76, Tab. VII, fig. 13.
 1863. — *Lamna* Krøyer, Nat. Tidsskr. 3. Række. B. II, p. 253.
 1907. — *producta* Wilson, Proc. U. S. Nat. Mus. Vol. XXXIII, p. 380, Pl. XXIII, fig. 79—87.
 !1913. — — T. & A. Scott, Brit. Paras. Copep., p. 86, Pl. XXII, fig. 3; Pl. XXVI, figs. 1—3; Pl. XXVII, figs. 1—8.

Occurrence. — Not taken by the "Ingolf".

Steenstrup & Lütken write that *D. producta* has been taken on *Lamna cornubica* two or three times at the Færoes, and the Copenhagen Museums possesses 6 specimens examined by these authors. (Among specimens of *D. ferox* from Jakobshavn, West Greenland, I found a single specimen of *D. producta*, but it is impossible to decide with certainty whether that specimen has incidentally been mixed up with *D. ferox* by some earlier student or it originates really from Greenland.)

Distribution. — T. & A. Scott put together several localities from the British Islands; it has been found from near Shetland to Cornwall, generally on *Lamna cornubica*, but once on *Alopias vulpes*. Steenstrup & Lütken mentions it from the Kattegat on *Lamna*. Cand. mag. Ad. Jensen took it on *Lamna* off Norway at Lat. $63^{\circ}56' N.$, Long. $6^{\circ}11' E.$; Krøyer possessed specimens taken on the same shark at Alten, Finmark. Wilson records it from Casco Bay, Maine, and from Lat. $38^{\circ}07' N.$, Long. $74^{\circ}21' W.$

Echthrogaleus Stp. & Ltk.

Only one species of this curious genus has been found within our area.

41. *Echthrogaleus coleoptratus* Guérin.

1837. *Dinematura coleoptrata* Guérin, Icon. Règne Animal, Pl. XXXV, fig. 6.
 !1861. *Echthrogaleus* — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter, 5. Række, naturv. og math. Afd. B. 5, p. 380, Tab. VIII, fig. 13.
 !1907. — — Wilson, Proc. U. S. Nat. Mus. Vol. XXXIII, p. 367, Pl. XIX, figs. 40—50.
 1913. — — T. & A. Scott, Brit. Paras. Copep. p. 89, Pl. XXII, fig. 4.

Occurrence. — Not taken by the "Ingolf".

At the Færoes this species has been secured two times on *Acanthias vulgaris* by Syssemand Müller; one among them is referred with some little doubt to this species by Steenstrup & Lütken, but the differences pointed out by them are of no specific value.

Distribution. — According to T. & A. Scott taken on *Lamna cornubica* near Fair Island, and at places in Scotland; at Polperro, Cornwall, both on the shark mentioned and on *Carcharias glaucus*. Olsson records it from Bohuslän. The Copenhagen Museum possesses it both from the northern and the southern temperate Atlantic. A. Brian records it (1899) from Porto Ferrario on *Carcharodon Rondeletii*; Stebbing had it from Table Bay, on *Orthogoriscus mola*. T. & A. Scott write: "The distribution of this *Echthrogaleus* is extensive and includes the seas of Europe, the Atlantic and Pacific coasts of North America and the coast of South Africa"; Wilson records it from Woods Hole, Mass. and from near Unalaska, Alaska.

Pandarus Leach.

Of this large genus only a single species has been taken in the "Ingolf" area.

42. *Pandarus bicolor* Leach.

1816. *Pandarus bicolor* Leach, Annulosa, p. 405, Pl. XX, figs. 1—2.
 1816. — *Boscii* Leach, ibid. p. 406, Pl. XX, figs. 1—10.
 1838. — *bicolor* Kröyer, Nat. Tidsskr. B. II, p. 34, Tab. I, fig. 6.
 1863. — — Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 261.
 !1907. — — Wilson, Proc. U. S. Nat. Mus. Vol. XXXIII, p. 400, Pl. XXVII, figs. 114—123.
 !1913. — — T. & A. Scott, Brit. Paras. Copep. p. 95, Pl. XXI, fig. 2; Pl. XXII, figs. 5—6;
 Pl. XXVI, figs. 4—19; Pl. LVIII, figs. 1—8. [With synonymy].

Occurrence. — Not taken by the "Ingolf".

In Faxefjord, West Iceland, 2 ovigerous females respectively on the upper and the lower side of the ventral fins of *Acanthias vulgaris*; Mag. sc. R. Hørring, Aug. 7, 1901.

Distribution. — According to T. & A. Scott living on *Galeus canis*, *Carcharias glaucus*, *Scyllium catulus*, and *Squalus mustelus*, at various places on the British Island, from Shetland to Plymouth. Not very rare at Bahuslän and in Skager Rak on *Acanthias vulgaris* (Olsson). Kröyer records it from the northern Kattegat and the North Sea, on *Galeus canis*; v. Beneden from the coast of Belgium, and Brian (1898) from Liguria on *Oxyrrhina Spallanzanii*.

Nesippus Heller.

Only a single species found in our area.

43. *Nesippus borealis* Stp. & Ltk.

- ! *Nogagus borealis* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skrifter, 5. Række, naturv. og math. Afd. B. V,
 p. 387, Tab. XI, fig. 21.
 ! *Nesippus* — Wilson, Proc. U. S. Nat. Mus. Vol. XXXIII, p. 437, Pl. XXXVII, figs. 224—231.

This species has been established on 3 males, and the female is still unknown. The fine animals agree well with Steenstrup & Lütken's figures, excepting as to one point, viz. the shape of the caudal rami.

These plates do not reach beyond the end of the anal segment; each plate has the posterior margin transverse and a little convex, with three strong setæ, while the fourth seta is placed on the outer margin much nearer to its base than to the terminal margin; in reality the caudal rami agree — also in one of the type-specimens, as to shape and length with Wilson's fig. 234 and not with fig. 21 of the Danish authors. On the exopod of fourth legs I found 3 spines, as drawn by Steenstrup & Lütken, while Wilson has only 2; the equipment of the antennulæ agrees with the figure and description of the Danish authors, not with Wilson's statement, and the same is the case as to the posterior lobes of the carapace. The differences between Wilson's specimen from the boreal Pacific and the Atlantic specimens are, however, so small that they may be due to individual or geographical variation.

Occurrence. — Not taken by the "Ingolf", but in pelagic hauls at a good number of places.

South-East of Greenland: Lat. $57^{\circ}56'$ N., Long. $44^{\circ} 2'$ W. June 8, 1883, at 8 o'clock in the evening, Captain Ryder; 1 specimen.

— - — Lat. $58^{\circ}11'$ N., Long. $38^{\circ}53'$ W., young-fish trawl, 30 m. wire out, "Tjalfe", Oct. 1, 1908; 1 specimen.

— - — Lat. $58^{\circ}23'$ N., Long. $34^{\circ}41'$ W., surface, "Tjalfe"; 1 specimen.

West of Iceland: Lat. $65^{\circ}00'$ N., Long. $28^{\circ}10'$ W., young-fish trawl, 15 m. wire out, "Thor", June 18, 1904; 1 specimen.

South of Iceland: Lat. $63^{\circ}08'$ N., Long. $21^{\circ}30'$ W., young-fish trawl, 70 m. wire out, "Thor", July 9, 1904; 1 specimen.

— - — Lat. 61° N., Long. 20° W. Olrik. July 12, 1867; 1 specimen.

— - — Lat. $61^{\circ}34'$ N., Long. $19^{\circ}05'$ W., young-fish trawl, 400 m. wire out, "Thor", July 10, 1904; 1 specimen.

— - — Lat. $61^{\circ}30'$ N., Long. $17^{\circ}08'$ W., young-fish trawl, 70 m. wire out, "Thor", July 11, 1904; 2 specimens.

— - — Lat. $63^{\circ}14'$ N., Long. $15^{\circ}36'$ W., young-fish trawl, 200 m. wire out, "Thor", May 24, 1904; 1 specimen.

— - — Lat. $62^{\circ}47'$ N., Long. $15^{\circ}03'$ W., young-fish trawl, "Thor", May 24, 1904; 1 specimen.

Distribution. — This species has been taken several times somewhat south of the "Ingolf" area at the following places: Lat. $58^{\circ}40'$ N., Long. $30^{\circ}40'$ W., surface, "Tjalfe"; 1 specimen. — Lat. $58^{\circ}24'$ N., Long. $30^{\circ}35'$ W., 500 m. wire out, "Tjalfe"; 1 specimen. — Lat. $59^{\circ}41'$ N., Long. $25^{\circ}02'$ W., 500 m. wire out, "Tjalfe"; 3 specimens. — Lat. $59^{\circ}25'$ N., Long. $22^{\circ}56'$ W., surface, "Tjalfe"; 1 specimen. — Lat. 58° N., Long. 19° W., Inspektør Olrik (Stp. & Ltk.). — Lat. 59° N., Long. 8° W. Captain Moberg (Stp. & Ltk.).

Besides the "Thor" has gathered *N. borealis* at two places South-West of Ireland, viz. at Lat. $51^{\circ}28'$ N., Long. $11^{\circ}50'$ W., 1 specimen; and Lat. $51^{\circ}00'$ N., Long. $11^{\circ}43'$ W., 1 specimen. T. & A. Scott does not mention it from Great Britain; Wilson records a specimen from Alaska.

Family Dichelesteiidæ.

Only 2 genera have hitherto been found in the "Ingolf" area.

Hatschekia Poche.

Only a single species is known from our area.

44. *Hatschekia Hippoglossi* Kr.

1837. *Clavella Hippoglossi* Krøyer, Nat. Tidsskr. B. I, p. 205, Tab. II, fig. 3 & 3 a.

1913. *Hatschekia hippoglossi* T. & A. Scott, Brit. Paras. Copep. p. 112, Pl. XXXIII, figs. 3—4; Pl. XXXIV
figs. 8—11.

Occurrence. — Taken by the "Ingolf" at three places on *Hippoglossus vulgaris*.

North-West Iceland: Isefjord; 11 females.

— — Dyrefjord; 4 females.

South-West — Reykjavik; 5 females.

The Copenhagen Museum possesses several specimens from West Greenland, some among them without special locality, while 6 specimens are from Godhavn (Disko Isl.) at Lat. 69°14' N. Furthermore numerous specimens have been secured by Mag. sc. W. Lundbeck in Önundarfjord, North-West Iceland; some specimens by Mag. sc. B. Sæmundsson in Faxe Bugt, West Iceland; and some by Dr. A. C. Johansen in Havnefjord, South-West Iceland; always on the gills of *Hippoglossus vulgaris*.

Distribution. — Not uncommon in the British seas (T. & A. Scott). Krøyer possessed it from Denmark; Olsson records it from Skager Rak and Storeggen, West Norway; v. Beneden had it evidently from Belgium.

Sabellacheres M. Sars.

This genus, which probably belongs to the present family, comprises only a single species.

45. *Sabellacheres gracilis* M. Sars.

1861. *Sabellacheres gracilis* M. Sars, Christiania Vid. Selsk. Forh. for 1861, p. 50.

Occurrence. — Not taken by the "Ingolf".

From the Riks Museum in Stockholm I have received a bottle with a large Annelid, according to the label being *Myxicola Steenstrupii* Kr., taken by O. Torell at Prøven, West Greenland, at Lat. 72°23' N., and bearing the parasitic Copepod. However, the parasite could not be found; I suppose that it has been lost before sent to me, but thinking it has been correctly determined, I venture to record it here as belonging to the fauna of West Greenland.

Distribution. — Tromsø, Finmark, on *Myxicola Sarsii* (M. Sars).

Division Lernæoidea.

Family Lernæidae.

Peniculus Nordm.

Only one species has been found in the "Ingolf" area.

46. *Peniculus clavatus* O. F. Müll.

1776. *Lernæa clavata* O. F. Müller, Zool. Danicæ Prodrömus p. 227.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 38, Tab. XXXIII, fig. 1.
 1863. *Peniculus clavatus* Kröyer, Nat. Tidsskr., 3. Række, B. II, p. 340, Tab. XIV, fig. 8, a—g.
 1868. — — Olsson, Lunds Univers. Årsskr. f. 1868, p. 27, Tab. II, fig. 10—11.
 1917. — — Wilson, Proc. U. S. Nat. Mus., Vol. 53, p. 46, Pl. I, figs. 1—7.

The specimens seen by me agree with Wilson's description and figures, but Olsson's figure of the head differs materially in shape, and Kröyer's figures are unsatisfactory. In spite of the differences I suppose that all three authors have examined specimens of the same species, especially as all their specimens had been taken on the unpaired fins of *Sebastes marinus*.

Occurrence. — Taken by the "Ingolf" at two stations.

Davis Strait: Stat. 33: Lat. 67°57' N., Long. 55°30' W., 35 fath., temp. 0°.8; 4 specimens on the dorsal fins of *Triglops Pingelii*.

— — Stat. 34: Lat. 65°17' N., Long. 54°17' W., 55 fath.; 1 specimen on the lower side of a ventral fin of *Sebastes marinus*.

Finally 3 specimens of the parasite have been taken at Jakobshavn (Lat. 69°13' W.), West Greenland, by Mag. sc. Traustedt, two among them respectively on the base of the right pectoral fin and on the base of the anal fin of *Triglops Pingelii*. Kröyer's two specimens were found on the caudal fin of a specimen of *Sebastes marinus* from West Greenland.

Distribution. — O. F. Müller had his specimens from Dröbak, Christiania Fjord, and Olsson records it from near Aalesund, West Norway. Wilson's specimens were secured off Cape Ann, Mass., and off Salem, Mass. All three authors record only *Sebastes marinus* as the host.

Sarcotretes Jungersen.

Wilson (1917) refers 6 species to this genus, but only one has been found in the "Ingolf" area.

47. *Sarcotretes Scopeli* Jungersen.

1911. *Sarcotretes scopeli* Jungersen, Vid. Medd. Nat. Forening Kjøbenhavn, B. 64, p. 1—21, Pls. I—II, figs. 1—26; *ibid.* p. 211—214.

Occurrence and Distribution. — Not taken by the "Ingolf".

This parasite has only been found on *Scopelus glacialis*. In the entrance to the Davis Strait it has been captured at Lat. 60°07' N., Long. 48°26' W. and West of Greenland at 7 stations up to 70°41' N., by

the "Tjalfe" (Cand. mag. Ad. Jensen), and West of Iceland at Lat. 65°00' N., Long. 28°10' W. by the "Thor" (Dr. Joh. Schmidt). Besides it has been secured by the "Thor" at a number of stations between Lat. 63°10' N. and 48°04' N., Long. 18°46' W. and 4°33' W.; one among these stations is situated South of Iceland, one North-West of the Færoes, and two South-West of the Færoes; the other stations are outside the "Ingolf" area, and the most southern South-West of Ireland; the depth was always considerable, "from 100 to 600 met. below the surface". Jungersen (l. c.) gives a complete list of the stations, with elucidations.

Lernæocera Blainville.

It is with reluctance that I follow Wilson in adopting Blainville's name for this genus, the type of which is generally known as *Lernæa branchialis* L. Only a single species has been found in our area.

48. *Lernæocera branchialis* L.

1767. *Lernæa branchialis* Linné, Systema Naturæ, 12th Ed., Vol. I, pt. 2, p. 1092.
 1780. — *gadina* O. Fabricius, Fauna Groenl. p. 336.
 !1861. — *branchialis* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr., 5. Række, naturv. og math. Afd. B. 5, p. 403, Tab. XIII, fig. 28.
 — — — var. *sigmoidea* Steenstrup & Lütken, ibid. p. 404, Tab. XIII, fig. 29.
 1868. — — Claus, Gesellsch. Naturw. Marburg, B. 9, Suppl., p. 16, Taf. 3—4.
 1913. — — T. & A. Scott, Brit. Paras. Copep. p. 142, Pls. XLII—XLIII.
 !1917. *Lernæocera* — Wilson, Proc. U. S. Nat. Mus., Vol. 53, p. 85; Pl. 10, fig. 88; Pl. 12, figs. 98—107; Pl. 17, fig. 140.

Occurrence. — Taken by the "Ingolf" at a single place.

North-West Iceland: Isefjord, on the branchiæ of *Gadus callarias*. 6 specimens.

This species is common at West Greenland, having been taken on the branchiæ of *Gadus ogac* or *G. callarias* at Godhavn, in Disko Bay, at Egedesminde, Ikamiut, Holstensborg, Godthaab, Arsuk, Julianehaab and Tunugliarfik, thus between Lat. 69°14' N. and 60°43' N. It is not known from East Greenland.

At North-West Iceland *L. branchialis* has been gathered in Adelvig, Isefjord and Dyrefjord; at South-West Iceland in Havnefjord and Grindavik; at North Iceland in Skagestrand Bugt, in Öfjord, and at Lat. 66°19' N., Long. 14°33' W. — It has also been found at the Færoes.

Distribution. — According to T. & A. Scott taken at a good number of places around the coasts of the British Islands on various species of Gadoids, "while young females with males attached to them may be found on the gill-filaments of flat-fishes such as the flounder, *Pleuronectes flesus*". Adult females have also been found on a good number of *Callionymus lyra* and on a *Centronotus gunnellus*. Furthermore known from Denmark, the western coasts of Sweden, Norway and Belgium. Wilson records it from the coasts of Maine and Massachusetts, and from Georges Banks.

Hæmobaphes Stp. & Ltk.

Only a single species is known from our area.

49. *Hæmobaphes cyclopterina* O. Fabr.

1780. *Lernæa cyclopterina* O. Fabricius, Fauna Groenl. p. 337.
 1837. — — Krøyer, Nat. Tidsskr. B. I, p. 502, Tab. V, fig. 4, a—e.
 1861. *Hæmobaphes* — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr., 5. Række, naturv. og math. Afd. B. 5, p. 405, Tab. XIII, fig. 30.
 1913. — — T. & A. Scott, Brit. Paras. Cop. p. 147, Pl. XLIV, figs. 5—7.
 1917. — — Wilson, Proc. U. S. Nat. Mus. Vol. 53, p. 95, Pl. 14, figs. 114—118.

Occurrence. — Taken by the "Ingolf" at a single place.

West Greenland: Holstensborg (Lat. 66°56' N.), on *Mallotus villosus*, at the beach; 1 specimen.

This parasite has been found within the "Ingolf" area on the following species of fishes: *Cottus scorpius*, *Cottus bubalis*, *Icelus bicornis* Reinh. (= *I. hamatus* Kr.), *Sebastes marinus*, *Gunellus fasciatus*, *Gymnelis viridis*, *Gadus saida*, *Gadus merlangus*, *Cyclopterus spinosus*, *Liparis Reinharti* and *Lip. tunicata*. At West-Greenland it has been taken several times, and the recorded localities are: Littleton Island (Miers), Lille Karajak Fjord (Vanhöffen), Godhavn, Egedesminde, and Sukkertoppen, thus from Lat. 78°24' to Lat. 65°25' N. — Furthermore it has been secured at South-West Iceland: Reykjavik and Havnefjord; finally at the Færoes.

Distribution. — Dunbar, Firth of Forth and Irish Sea, on *Agonus cataphractus* and *Centronotus gunnellus* (T. & A. Scott). At America taken on *Lycenchelys (Lycodes) Verrillii* in the Gulf of Maine and "near La Have"; finally in the Sea of Japan off Korea on *Cyclogaster ingens* (Wilson).

Pennella Oken.

Two species have been found in the most south-easterly part of the "Ingolf" area.

50. *Pennella crassicornis* Stp. & Ltk.

1861. *Pennella crassicornis* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr. 5. Række, naturv. og math. Afd. B. 5, p. 416, Tab. XIV, fig. 34.

Occurrence. — The Danish authors established this species on a number of specimens received from Sysselmand Müller and taken at the Færoes on a specimen of *Hyperoodon rostratus*.

Distribution. — Found on a *Hyperoodon* captured in Lille Belt, Denmark (Steenstrup & Lütken).

51. *Pennella Balænoptera* Kor. & Dan.

1877. *Pennella Balænoptera* Koren & Danielssen, Fauna littoralis Norvegiæ, pt. 3, p. 157, Pl. 16, figs. 1—9.
 1905. — — Turner, Trans. Roy. Soc. Edinburgh, Vol. 41, pt. 2, No. 18, p. 409—34, Pls. I—IV.

Occurrence. — Of this gigantic species 4 specimens have been secured at the Færoes on a finner whale, probably *Balænoptera musculus*, by Captain Grön.

Distributién. — Koren & Danielssen records specimens as taken on *Balaenoptera rostrata*, certainly off Norway; Turner's specimens were given him by the manager of a whaling station in the north of Shetland as taken on *Bal. musculus*; Anthony & Calvey found it at Cette on *Bal. physalus*.

Family Sphyrriidæ.

Sphyrion Cuv.

Only a single species has been found within our area.

52. *Sphyrion Lumpi* Kröyer.

1845. *Lestes Lumpi* Kröyer, Danmarks Fiske, B. II, p. 517 (nomen nudum).
 1863. *Lesteira Lumpi* Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 399, Tab. XVIII, fig. 5, a—g.
 1869. — — Steenstrup, Overs. Kgl. D. Vid. Selsk. Selsk. Forhandl., 1861, p. 182, Tab. II, fig. 4—5.
 1913. *Sphyrion lumpi* T. & A. Scott, Brit. Paras. Cop. p. 164, Pl. LI, figs. 3, 4.
 !1919. — — Wilson, Proc. U. S. Nat. Mus. Vol. 55, p. 570, Pls. 50, 51, and 52.

Occurrence. — Not secured by the "Ingolf".

At northern West Greenland it has been taken at Umanak (Lat. 70°42' N.) by Fleischer, and at Ikerasak (Lat. 70°30' N.) by Olrik. — At Iceland it has been found four times, at least once on *Cyclopterus lumpus*; special localities are: Reykjavik (Gröndal), and south-east of Vestman-Öerne, in the stomach of *Raja batis* (Mag. sc. R. Hörring).

Distribution. — On a specimen of *Sebastes marinus* from Lat. 62½° N., Long. 1°56' E., 275—300 fath., captured by the "Michael Sars" (Cand. mag. Ad. Jensen) 3 specimens near each other at the anus; one of these specimens is very large, another more than half-grown, and the third is small. T. & A. Scott record it from Aberdeen on *Cyclopterus lumpus* and from the North Sea on *Anarrhichas lupus*. Wilson records it from off Cape Cod on *Sebastes marinus*, from off New Jersey on *Nematonurus Goodei* and *Haloporphyrus viola*.

Family Chondracanthidæ.

The two old genera *Chondracanthus* Delaroche and *Diocus* Kr. are well represented in the "Ingolf" area. The genus *Tanypleurus* Stp. & Ltk., which is imperfectly known, is, at least provisionally, referred to the present family.

Chondracanthus Delaroche.

From the "Ingolf" area 6 species are enumerated here; if one would follow T. & A. Scott's work a seventh species, *C. fluræ* Kr., established by Kröyer on specimens from Iceland, should be accepted, but judging from the considerable variation in shape among specimens of *C. cornutus*, *C. fluræ* must be regarded as a variety. The females of some species show rather considerable individual variation and very few features affording specific characters; a rich material not only from the "Ingolf" area but from Norway, Great Britain and France must be studied, if all difficulties shall be solved.

The figures and descriptions of the males in the literature are generally of slight or no value as to the separation of species, which is easily understood, as males belonging to different but allied species are not

only very similar in general aspect, but their thickness and curvature make a thorough examination of most of their appendages very difficult; it will be no easy task for a future carcinologist to have the appendages arranged so that the same pair in different species can be seen and drawn nearly exactly from the same side, but that it necessary for a real comparison, for pointing out specific characters. Some few remarks on males may be given here.

I have examined males of *C. cornutus*, *C. Lophii*, *C. nodosus*, and *C. radiatus*. In the last-named form the two pairs of thoracic appendages are very distinctly biramous (Pl. III, fig. 6 d) and larger than in the other species; their sympod is very oblong, the exopod more than half as long as the sympod, and the endopod considerably shorter and thinner than the exopod. In males of *C. Lophii* the first pair of legs is scarcely larger than the second, the sympod is robust, the exopod terminal, extremely small in the first and somewhat larger in the second pair, while in both pairs a rudimentary endopod exists on the inner side of the sympod somewhat before its end. In *C. cornutus* the first pair of legs is conspicuously larger than the second, and both are seemingly unramified, consisting of an oval sympod terminating in two or three strong setæ. In a male of *C. nodosus* I found these two pairs of legs considerably smaller than in the other forms; first pair a little shorter than second, and both pairs simple, as in *C. cornutus*. — Specific differences are also to be found in second joint of the maxillipeds which is distinctly produced into a protuberance below the insertion of third joint, but in *C. radiatus* (fig. 6 b) considerably more produced than in the three other species. The caudal rami are also much longer in *C. radiatus* (fig. 6 e) than in the other forms mentioned.

53. *Chondracanthus cornutus* O. F. Müll.

1776. *Lernæa cornuta* O. F. Müller, Zool. Danicæ Prodromus, p. 227.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 40, Tab. XXXIII, fig. 6.
 !1863. *Chondracanthus cornutus* Krøyer, Naturh. Tidsskr. 3. Række, B. II, p. 323, 329, Tab. XIII, fig. 7, a—d.
 ! — — *Fluræ* Krøyer, ibid. p. 323, 330, Tab. XIII, fig. 6, a—b.
 !1913. — — *cornutus* T. & A. Scott, Brit. Paras. Cop. p. 168, Pl. XLVII, figs. 1, 2; Pl. LII, fig. 5; Pl. LIII, figs. 1—9 [with synonymy].
 — — *fluræ* T. & A. Scott, ibid. p. 171, Pl. XLVII, fig. 5; Pl. LIII, figs. 10—11.

It is seen that in spite of Krøyer and T. & A. Scott, I find it necessary to cancel *C. fluræ* Kr. as a separate species. The English authors quoted say that *C. cornutus* lives on *Pleuronectes platessa*, and *C. fluræ* has only been found on *Drepanopsetta platessoides*. On the gills of the last-named fish Mag. sc. W. Lundbeck took 11 females in Önundarfjord (Iceland); they vary considerably in shape, showing every transition between the long and narrow typical *C. cornutus* to the rather broad *C. fluræ* with the two thoracic segments subequal in length and sharply marked off, though even the broadest specimen is a little longer and less broad than Krøyer's types. And the same zoologist found in *Pleur. platessa* captured in the same fjord a female (with ovisacs) which is very broad and short with the thoracic segments well marked off, a typical *C. fluræ*. Specimens taken by the "Ingolf" on *Pleur. platessa* in Seydisfjord differ also much in outline; one among them agrees with Krøyer's figure of *C. fluræ*, another nearly with his figure of *C. cornutus*. At West Greenland,

where *Pleur. platessa* does not live, Mag. sc. Traustedt has taken a typical specimen of *C. fluræ* and besides 3 specimens, which are rather slender and more similar to the typical *C. cornutus* than to *C. fluræ*; all 4 specimens have probably lived on *Drepanopsitta*.

Occurrence. — Taken by the "Ingolf" at two places, on *Pleuronectes platessa*.

North-West Iceland: Dyrefjord; 10 females.

East Iceland: Seydisfjord; 6 females.

At West Greenland it has been found at Jakobshavn and Egedesminde, perhaps also at Godthaab. — Mag. sc. W. Lundbeck has, as already mentioned, gathered it in Önundarfjord, North-West Iceland; at South-West Iceland it has been found in Havnefjord (Fritz Johansen). — Dr. A. C. Johansen took a considerable number on *Pleur. platessa* at Thorshavn, Strömö, one of the Færoes.

Distribution. — "Various parts of the British coasts" (T. & A. Scott); Roscoff (C. Vogt); Belgium (v. Beneden); Bohuslän, in *Pleuronectes flesus* and *P. limanda* (Olsson); Skager Rak not far from the Danish coast (Olsson); Massachusetts (Mary Rathbun).

54. *Chondracanthus Limandæ* Kr.

!1863. *Chondracanthus Limandæ* Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 322, 330, Tab. XIV, fig. 2, a—b.

!1913. — *limandæ* T. & A. Scott, Brit. Paras. Cop. p. 174, Pl. XLVII, fig. 6; Pl. LVI, figs. 11, 12.

The three females from our area agree so much with Kröyer's description and figures of *C. Limandæ* and differ so sharply from the other species established on parasites on flat fishes, that they must be referred to that form. The first thoracic segment is dorsally very short and nearly confluent with the second segment, which is broad, moderately long and with a pair of large, dorso-lateral, rounded protuberances; second legs are somewhat short, thick, and nearly inflated.

Occurrence. — Taken by the "Ingolf" at a single locality.

Færoes: Trangisvaag, on the lower branchia and in the gill-cavity of *Pleuronectes flesus*; 3 females.

Distribution. — Firth of Clyde, Moray Firth, and Irish Sea; on *Pleuronectes limanda* (T. & A. Scott). — Kattegat, on the same flat fish (Kröyer).

55. *Chondracanthus clavatus* Bassett-Smith.

1896. *Chondracanthus clavatus* Bassett-Smith, Ann. Mag. Nat. Hist. 6. ser. Vol. XVIII, p. 13, Pl. V, fig. 6.

!1913. — — T. & A. Scott, Brit. Paras. Cop. p. 175, Pl. XLVII, fig. 7; Pl. LVI, figs. 14, 15.

Occurrence. — Taken by the "Ingolf" at a single locality.

Færoes: Trangisvaag, below in the branchial cavities and on the lowest gills of *Pleuronectes microcephalus*; 12 females.

Furthermore 9 specimens have been taken on the same flat fish at the same locality by Mag. sc. R. Hörring.

Distribution. — Hitherto only recorded by British authors, from Plymouth, Firths of Forth and Clyde.

56. *Chondracanthus nodosus* O. F. Müll.

1776. *Lernæa nodosa* O. F. Müller, Zool. Danicæ Prodrömus, p. 227.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 40, Tab. XXXIII, fig. 5.
 1780. — — O. Fabricius, Fauna Groenl. p. 341.
 1838. *Chondracanthus nodosus* Kröyer, Nat. Tidsskr. B. II, p. 133, Tab. III, fig. 2, a—f.
 1863. — — Kröyer, Nat. Tidsskr. 3. Række B. II, p. 332.
 !1913. — — T. & A. Scott, Brit. Paras. Cop. p. 176, Pl. LII, figs. 1—3; Pl. XLVIII, figs. 13—16.

Occurrence. — Not secured by the "Ingolf".

This species lives on *Sebastes marinus*. It has been taken some times at West Greenland; special localities are Godthaab and Julianehaab (Lat. 60°43' N.). — Kröyer records it from the Færoes.

Distribution. — North Sea (T. Scott); Norway, f. inst. off Bergen; Skager Rak, and the Sound (Olsson).

57. *Chondracanthus Lophii* Johns.

1836. *Chondracanthus Lophii* Johnston, London's Mag. Nat. Hist. Vol. IX, p. 81, fig. 16.
 1837. — *gibbosus* Kröyer, Nat. Tidsskr. B. I, p. 252, Pl. II, fig. 4, 4 a; Pl. III, fig. 2, a—c.
 !1862. — *lophii* Turner & Wilson, Trans. Roy. Soc. Edinburgh, Vol. XXIII, pt. I, p. 67, Pl. III.
 1863. — *gibbosus* Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 332.
 !1913. — *lophii* T. & A. Scott, Brit. Paras. Cop. p. 179, Pl. LII, fig. 4; Pl. LVI, figs. 16—18.

Occurrence. — Not taken by the "Ingolf".

This species lives on *Lophius piscatorius*; the Copenhagen Museum possesses 2 females from the Mediterranean and taken on *Lophius Budegassæ*. It is not known from Greenland or Iceland. At the Færoes it has been taken in Aadnafjord and Kalbaksfjord by Mag. sc. R. Hörring.

Distribution. — Moderately common at Great Britain and Ireland (various authors); Roscoff (C. Vogt); Belgium (v. Beneden); Skager Rak (Olsson); Hirtsholmen (Kröyer); Kullaberg (Lilljeborg); in the Sound north of Hveen (G. Winther, according to a handwritten note). The Copenhagen Museum possesses it from Bergen, from Villafranca and the Adriatic.

58. *Chondracanthus radiatus* O. F. Müll.

(Pl. III, figs. 6 a—6 e.)

1776. *Lernæa radiata* O. F. Müller, Zool. Danicæ Prodrömus, p. 226.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 39, Pl. XXXIII, fig. 4.
 1780. — — O. Fabricius, Fauna Groenl. p. 340.
 !1863. *Chondracanthus radiatus* Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 325, 331, Tab. XIV, fig. 5, a—1.

Kröyer has published a detailed and on the whole good description (in Danish) of the adult female, together with a figure of a half-grown female. His description and figures of the adult male are less satisfactory, and therefore five figures are given here. Fig. 6 a shows the antennula, which is indistinctly divided into 3 joints. Figs. 6 b and 6 c represent the left maxilla and the maxilliped drawn with the same degree of

enlargement and consequently showing not only their shape but their relative size. In the maxilliped the second joint is, as mentioned above, strongly produced as a process below the third joint, so that this process together with third joint and the real claw constitutes a kind of imperfect chela; the process has its rounded end equipped with some minute bristles. Fig. 6 d exhibits the two left thoracic legs described above (p. 43); fig. 6 e the posterior part of the body with the caudal rami, each terminating in a very thick spine not longer than the ramus.

Remarks. — A. Brian described and figured¹ a female with its male of a *Chondracanthus*, which he referred with a query to *Ch. radiatus*; the parasite was found on *Coryphænoides gigas* captured at Lat. 38°08' N., Long. 23°18¾' W. Judging from Brian's figures of female and male the parasite cannot belong to *Ch. radiatus*. The female differs from this species in various particulars, most of them noted by Brian (who has translated a considerable portion of Krøyer's text into French); and his figure of the male differs in various features. Thus the shape of the maxillæ, the maxillipeds, the caudal rami, and above all in the fact that on two figures we find three pairs of thoracic appendages, while *Ch. radiatus* has only two pairs, and no male of any boreal or arctic species of *Chondracanthus* examined by me possesses more than two pairs of thoracic legs.

Occurrence. — The "Ingolf" captured at two stations specimens of *Macrurus Fabricii* with this parasite in the branchial cavity.

Davis Strait: Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fathoms, temp. 3°6; 1 female on the lower wall of the branchial cavity.

— — Stat. 27: Lat. 64°54' N., Long. 55°10' W., 393 fathoms, temp. 3°8; 1 small and 2 large females on the inner side of one of the gill-covers.

Krøyer's specimens were taken on *Macrurus Fabricii* and probably at Godthaab (by Holböll); O. Fabricius states, that it lives on *Coryphæna rupestris*, but according to Lütken (1898) *Cor. rupestris* Fabr. (not Gunn.) is synonymous with *M. Fabricii*.

Ch. radiatus is hitherto only known from West Greenland.

Diocus Krøyer.

This genus was established on a single form, *D. gobinus* O. F. Müll., from West Greenland; the "Ingolf" material contains another and hitherto unknown species. Krøyer pointed out that the genus is so closely allied to *Chondracanthus* that it is not easy to draw a fair distinction between them. As 2 species are now known, some remarks on the structure of both sexes may be made here.

In the female the body consists of a small head, a large trunk with three pairs of processes, and a small abdomen. In the adult the antennulæ are quite small and indistinctly jointed (or in *D. frigidus* possibly wanting); the antennæ consist of a small but thick joint with a robust claw; the mouth-parts in *D. gobinus* according to Krøyer (1863, p. 333) nearly as in *Chondracanthus*. The body is divided into an anterior part with a single pair of processes, and a posterior part with two pairs, sometimes ramified.

The male is in general aspect (Pl. III, fig. 8 c) and most features similar to those of *Chondracanthus*,

¹ Résultats Camp. Scient. par Albert 1er, Prince Souv. Monaco, Fasc. XXXVIII, 1912, p. 34, Pl. V, fig. 6 et 7; Pl. XI, fig. 1 et 2.

but is yet distinguished by several features. The antennulæ (Pl. III, figs. 7 a and 8 d) are divided into several joints, of which the two or three distal ones are well marked off. The antennæ have an unjointed exopod of very considerably length (figs. 7 a and 8 d) and with terminal setæ; this exopod is wanting in *Chondracanthus* (already pointed out by Krøyer). The mandibles have the saw-teeth less numerous and more coarse than in *Chondracanthus*. The maxillulæ are, partly or completely (?), seen on fig. 8 c and marked *mx*. The maxillipeds (fig. 8 e, *mp*) are more slender than in *Chondracanthus* and their second joint not produced distally below the following joint. Only two pairs of thoracic legs are found in *Chondracanthus* — at least in the boreal and arctic species —; in *Diocus* these two pairs are present, but besides the third pair exists at least as a couple of setæ, the fourth pair is either a minute rudiment or scarcely visible, while fifth pair is proportionately well developed (fig. 8 c) and may even (in *D. gobinus*) be distinctly biramous.

59. ***Diocus frigidus*** n. sp.

(Pl. III, figs. 8 a—8 e.)

Female. — In general aspect (figs. 8 a—8 b) very different from *D. gobinus*. The head is produced considerably downwards, and the produced part compressed from in front, so that the terminal area with antennæ and some mouth-parts visible as tiny knots is transverse; antennulæ could not be perceived (may be lost?) on the single specimen removed from its place. — The anterior part of the trunk is dorsally towards the sides (fig. 8 b) and across the ventral surface (fig. 8 a) marked off from the posterior part; on each side it is produced into a moderately long and very thick process directed outwards, downwards and backwards. The second part of the trunk is much larger, both much longer and broader, than the anterior part; each lateral portion is produced backwards into an extremely large protuberance, a little longer than broad and tapering with the end rounded; on the anterior portion of the ventral surface of the second part two very distant, proportionately somewhat small though rather thick protuberances, about as long as thick, directed downwards and somewhat outwards. On the upper side of the same second part two very deep, very oblong, very oblique, and rather distant impressions are found a little behind the middle, while the ventral surface has two distant, deep and somewhat triangular impressions united by a more feeble transverse impression. — The abdomen is a rounded protuberance distinctly broader than long. — The ovisacs in the specimen delineated somewhat unequal in length, the longest one being about twice as long as the median line of the animal.

Length in the median line 5.7 mm.

Male (fig. 8 c). So similar to the male of *D. gobinus* that it is uncertain whether all the rather few and on the whole small differences found between them are of specific value. The major proximal part of the antennulæ (fig. 8 d) is not as broad as in *D. gobinus* (fig. 7 a), but this feature may be uncertain, and besides the number of joints can not be ascertained with real certainty in any of the two species. The exopod of the antenna (fig. 8 d) a little longer and more slender than in *D. gobinus* (fig. 7 a), with its terminal part somewhat different. Third joint of the maxillipeds (fig. 8 e) shorter and a little thicker than in *D. gobinus*. The two anterior pairs of legs small, but with two minute rami in both species; of third legs in *D. frigidus* only a couple of setæ is visible, while in *D. gobinus* the leg itself is present as a minute knot; fourth legs could not be seen

with any certainty in *D. frigidus*, but in *D. gobinus* each leg is present as an exceedingly minute protuberance terminating in a single seta; fifth legs are distinctly biramous in *D. gobinus* (fig. 7 b), but whether the same is the case in *D. frigidus* could not be decided. — The spine on the end of each caudal ramus is straight and moderately long in *D. frigidus* (fig. 8 c), conspicuously longer, thicker, and besides much curved upwards in *D. gobinus* (fig. 7 b).

Length (in curved condition) 0.8 mm.

Occurrence. — Taken by the "Ingolf" at a single station in the cold area.

East of Iceland: Stat. 102: Lat. 66°23' N., Long. 10°26' W., 750 fathoms, temp. ÷0.9°; 2 females with males on the inner side of the operculum of a specimen of *Lycodes frigidus*.

60. *Diocus gobinus* O. F. Müll.

(Pl. III, figs. 7 a—7 c.)

1776. *Lernæa gobina* O. F. Müller, Zool. Danicæ Prodrömus, p. 226.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 39; Tab. XXXIII, fig. 3.
 1780. — — O. Fabricius, Fauna Groenl. p. 339.
 1837. *Chondracanthus gobinus* Kröyer, Nat. Tidsskr. B. I, p. 280, Tab. II, fig. 8; Tab. III, fig. 12, a—b.
 1861. *Diocus* — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr. 5. Række, naturv. og math. Afd. B. 5, p. 423, Tab. XV, fig. 39.
 1863. — — Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 333.

The female is well known from the text and good figures given by Steenstrup & Lütken, together with Kröyer's description in 1863. The male has been rather well figured by Steenstrup & Lütken, but the remarks set forth above on this animal in the description of *D. frigidus*, together with figs. 7 a and 7 b may serve as an addition.

Larval Male. Fig. 7 c represents the single specimen observed (found by Dr. Wesenberg-Lund on an immature female); unfortunately it was only moderately well preserved, with the result that some particulars, especially in the natatory legs, could not be made out with certainty. It is a Cyclopid-stage; the animal is 0.44 mm. long.

Cephalothorax rather oblong. — The abdomen considerably more than half as long as cephalothorax and consists of five segments; the caudal rami are somewhat small, a little longer than broad, each with a very long and proximally robust seta, and besides a moderately short seta.

The antennulæ considerably less than half as long as the cephalothorax, shaped and articulated as in the adult male; only the three or four distal joints, together scarcely half of the antennula, are distinctly marked off. — Antennæ as in the adult, consisting of a very robust joint with a long, strong, curved claw; the exopod is well developed and terminates in a hook-shaped spine. — Maxillæ reminding of those in the adult. — Maxillipeds somewhat long and rather slender; third joint and claw together nearly as long as second joint. — Two pairs of natatory legs are well developed and nearly similar; in both pairs their rami — as far as could be made out — are two-jointed, second joint longer and broader than the first, with about 6 marginal spines.

Occurrence. — Not taken by the "Ingolf".

This species is only known from localities at West Greenland, and seems to be rather common in the anterior lower part of the branchial cavity of *Phobctor ventralis* (= *tricuspis* Reinh.). The Copenhagen Museum possesses old specimens from Godhavn (Olrik), besides a good number in all probability from Egedesminde (Mag. sc. M. Levinsen), and a couple of specimens from Jakobshavn (Traustedt). O. Fabricius had most probably his specimens from Frederikshaab.

Tanypleurus Stp. & Ltk.

In some respects this genus, based on a single species, shows affinities to *Chondracanthus*, but it differs widely in some other features, especially in possessing a quite anomalous organ for fastening itself on the host. It may perhaps find a provisional place at the end of the present family.

61. *Tanypleurus alcornis* Stp. & Ltk.

1861. *Tanypleurus alcornis* Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr., 5. Række, naturv. og math. Afd. B. 5, p. 425, Tab. XV, fig. 38.

The material enumerated below is only that on which the Danish authors quoted more than sixty years ago established this curious form. As the specimens are still older and somewhat soft, a dissection of the front part of a specimen would probably not yield any real result, and without such special investigation I cannot add anything with certainty to the description of the authors.

Occurrence. — Not taken by the "Ingolf".

West Greenland (without special locality). On the branchiæ of *Cyclopterus spinosus*. Dr. Rink leg.
2 females.

— — Umanak (Lat. 70°40' N.). In the stomach of *Somniosus microcephalus*. Fleischer leg.
2 females.

Family Lernæopodidæ.

Charopinus Krøyer.

Three species have been found in the "Ingolf" area.

62. *Charopinus Dalmanni* Retzius.

1829. *Lernæa Dalmanni* Retzius, Kgl. Sv. Vet. Akad. Handl. 1829, p. 109, Tab. VI.
1837. *Lernæopoda* — Krøyer, Nat. Tidsskr. B. I, p. 264, Tab. II, fig. 11; Tab. III, fig. 4, a—b.
1862. — — Turner & Wilson, Trans. Roy. Soc. Edinburgh, Vol. XXIII, pt. I, p. 77,
Pl. IV.
1863. *Charopinus* — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 354, Tab. XIV, fig. 6, a—g.
1893. — *dalmanni* T. & A. Scott, Brit. Paras. Cop. p. 189, Pl. LV, figs. 1—4; Pl. LIV, figs. 12—17.
1915. — — Wilson, Proc. U. S. Nat. Mus. Vol. 47, p. 655.

Occurrence. — Not taken by the "Ingolf".

The parasite lives "in the nasal fossæ or spiracles" of *Raja batís*. The Copenhagen Museum possesses 4 specimens from Iceland; 3 of these have been determined by Krøyer and may be those mentioned by him in 1837.

Distribution. — Firth of Forth; fish-market at Aberdeen; Irish Sea; Cornwall (various authors). Krøyer saw it in Aalbæk, far north on the east coast of Jutland; besides known from Skager Rak, and at Norway from Christianssund (Retzius) and Storeggen (west of Norway) (Olsson). Finally it is recorded from the Adriatic (Valle) and Genova (Brian, 1898) as living on some other species of fishes.

63. *Charopinus cluthæ* T. Scott.

1900. *Lernæopoda cluthæ* T. Scott, 18th Annual Rep. Fish. Board Scotland, p. 173, Pl. VIII, figs. 27—37.
 1913. — — T. & A. Scott, Brit. Paras. Cop. p. 198, Pl. XL, figs. 1—3; Pl. LVII, figs. 1—7;
 Pl. LVIII, fig. 16.

According to Scott's figure of the male its abdomen is well segmented, consequently the species has with good reason been referred to *Charopinus* by Wilson (op. cit. p. 653); yet it may be remarked that the last-named author commits a curious error in the same paper in also referring this form to *Lernæopodina* Wilson (p. 632 and 640).

Occurrence. — Taken by the "Ingolf" at a single locality.

North-West Iceland: Isafjord, on the branchiæ of *Raja radiata*; 3 females.

Distribution. — According to Scott only known from two places at Great Britain, viz. in the Firth of Clyde on *Raja fullonica*, and Northumberland coast on *Raja radiata*.

64. *Charopinus ramosus* Krøyer.

1863. *Charopinus ramosus* Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 358, Tab. XIV, fig. 5, a—i.
 1913. — — T. & A. Scott, Brit. Paras. Cop. p. 191, Pl. LV, figs. 6, 7, Pl. LIV, figs. 18—22.

The females enumerated below from the "Ingolf" area differ from Krøyer's and Scott's figures in having the caudal rami very much shorter; besides the terminal rami on the maxillæ, though slender, decrease considerably in thickness from the base to the obtuse end.

Occurrence. — Secured by the "Ingolf" at two places.

North-West Iceland: Isafjord, in a branchial cavity of *Raja radiata*; 1 female.

East Iceland: Eskifjord, in the posterior pair of branchial chambers, 2 females, one among them with a male.

Distribution. — According to Scott "on the gills and gill-arches of *Raia clavata* and *Raia maculata*"; fish-market in Aberdeen, and Irish Sea. Besides Nymindégab, west coast of Jutland (Krøyer).

Salmincola Wilson.

Three species are to be recorded. Wilson enumerates 20 species of this genus, but I suppose that an investigation based on very rich material may reduce the number.

65. *Salmincola Carpionis* Kr.

1837. *Lernæopoda Carpionis* Krøyer, Nat. Tidsskr. B. I, p. 268, Tab. II, fig. 6.

1863. — — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 351, Tab. XIV, fig. 4, a—g.

Krøyer is quite right in separating this species from *S. salmonea* L., and in 1863 he published diagnoses (in Latin) of both species. Especially by the size and direction of the head together with the orbicular bulla placed on a long or at least moderately long stalk *S. Carpionis* is instantly distinguished from *S. salmonea*.

Occurrence. — Taken by the "Ingolf" at a single place.

West Greenland: Sukkertoppen (Lat. 65°25' N.); on a gill-arch of *Salmo alpinus*; 1 female (together with *Salmincola alpina* Olss.)

Krøyer records it from West Greenland and Iceland on what he names *Salmo carpio* — in reality *Salmo alpinus* —, but without special localities. It has been found numerous times at West Greenland on *S. alpinus*, on the inner side of the operculum or — and sometimes in large number — on the tongue and the roof of the mouth; special localities are: Godhavn (Lat. 69°14' N.), Fiskenaes (Lat. 63°05' N.), and Julianehaab (Lat. 60°43' N.). (The Rev. P. H. Sørensen in Julianehaab has sent to our Museum specimens taken on *Salmo* sp. and besides a specimen according to the label taken on *Sebastes marinus*, which seems somewhat improbable, though perhaps possible). — In East Greenland the parasite has been taken at two places, viz. at Danmarks Ö (Hekla Havn, Lat. 70°27' N.) (Wesenberg-Lund 1895), and on a large "*Salmo salvelinus*" taken by the Danmark-Exped. in the large lake behind the Hvalrosodde, Lat. 76°55' N. (K. Stephensen).

At Iceland *S. Carpionis* has been taken some four times; the only special locality noted is Öfjord, North Iceland, where it was found on *Salmo alpinus*.

66. *Salmincola alpina* Olsson.

Pl. III, figs. 9 a—9 e).

1877. *Lernæopoda alpina* Olsson, Öfv. kgl. Sv. Vet.-Akad. Förh. 1877, No. 5, p. 82, Tafl. IV, fig. 9—13.

1915. ?*Salmincola oquassa* Wilson, Proc. U. S. Nat. Mus. Vol. 47, p. 611, Pl. 31, figs. 36—40.

Professor Dr. Jägerskjöld, Director of the Museum in Göteborg, has most benevolently lent me Olsson's type-specimens of *Lernæopoda alpina*, for which I beg him to accept my sincere thanks. A direct comparison of these specimens with my figures and the specimens from Greenland and Iceland shows the most complete agreement not only in general outline but in antennulæ, maxillulæ, maxillipeds and above all in the antennæ. Olsson's figure of the whole animal is not good, and as to general shape of the body and the insertion of the ovisacs my animals agree with Wilson's figure of *S. oquassa*.

Cephalothorax is, as said by Wilson, "narrow and much longer than wide, forming with the trunk a crescent or semicircle", and seen from in front it agrees with his fig. 37; the trunk is "pear-shaped, strongly narrowed anteriorly but without a definite neck; squarely truncated posteriorly". — The ovisacs vary both in Olsson's types and in the numerous specimens from the "Ingolf" area very much in length and relative thickness, from being as long as trunk plus head to a little shorter than the trunk.

Antennulæ (fig. 9 a, *a*¹) two-jointed, on the end with a rather thick spine and a few extremely minute bristles. — Antennæ (fig. 9 a) characteristic; the proximal portion is two-jointed; each antenna has one spiniferous protuberance (*e*) on the outer side, two terminal protuberances and between these a protruding joint (*h*), which at the lower margin is produced into an oblong-triangular process, and above this it has two smaller, acute denticles. The lower protuberance (*f*) is short with numerous spines, the upper protuberance (*g*) is much larger, somewhat broader than long, with a rather small number of spines, of which the upper ones are a little curved in opposite direction of those on the lower part. — Mandibles (fig. 9 d) with about 4 teeth. — Maxillulæ (fig. 9 b and 9 e) with three protuberances near each other, each terminating in a spine. — Maxillæ rather stout, nearly as long as, or somewhat shorter than, the trunk; bulla conical, at the end a little broader than a maxilla. — Maxillipeds (fig. 9 c) rather long; second joint on the inner side produced into a process with a couple of denticles on the end; third joint terminates in a short, very curved claw and on the angle a minute denticle.

Length 4—5 mm.

Remarks. — Whether *S. oquassa* belongs to the present species is uncertain, as Wilson's figure of the antenna shows considerable difference from mine.

Occurrence. — Taken by the "Ingolf" at a single place.

West Greenland: Sukkertoppen (Lat. 65°25' N.), on gill-arches of *Salmo alpinus*; 5 specimens (together with 1 specimen of *Salmincola Carpionis*).

At West Greenland it has been taken some few times, thus at one of the northern colonies on *Salmo alpinus* (Pfaff leg.); at Julianehaab (Lat. 60°43' N.) on the roof of the mouth of *Salmo* sp. (Rev. P. H. Sørensen); without special locality on *S. carpio* and on *Gasterosteus aculeatus* var. *dimidiatus* (Krøyerian specimens). (Besides 2 specimens have been sent to our Museum as taken on *Sebastes marinus* by the Rev. P. H. Sørensen, Julianehaab). — In East Greenland the parasite has been taken in Hekla Havn, Lat. 70°27' N., on *Salmo alpinus*.

From Iceland the Museum possesses a good number of specimens taken on *Salmo alpinus* in several lakes: Myvatn, Ljosvatn, Svartarvatn, Thingvallir, and Nidálstunga.

Distribution. — Olsson records *S. alpina* from *Salmo alpinus* in two Swedish lakes, Näckten and Storsjön. — Wilson records his *Salmincola oquassa* from *Salvelinus oquassa*, at Rangeley Lakes, Maine.

67. *Salmincola arcturi* Miers.

1877. *Lernæopoda arcturi* Miers, Ann. Mag. Nat. Hist. ser. 4, Vol. XX, p. 106, Pl. IV, fig. 2.

As to the validity of this form I have no opinion.

Occurrence. — Not taken by the "Ingolf". — The only locality hitherto known is Floeberg Beach, Lat. 82°26' N. near West Greenland, where it was taken on the gills of *Salmo arcturus* Günther.

Lernæopoda Blainville.

This genus comprises 5 species from our area; 2 among them are new to science, and a third remains here only until further details are obtained.

68. *Lernæopoda elongata* Grant.

1827. *Lernæa elongata* Grant, Edinburgh Journ. of Science, Vol. VII, p. 147, Pl. II, fig. 5.
 1837. *Lernæopoda* — Krøyer, Nat. Tidsskr., B. I, p. 259, Tab. II, fig. 12; Tab. III, fig. 3, a—k.
 1861. — — Steenstrup & Lütken, Kgl. D. Vid. Selsk. Skr. 5. Række, naturv. og math. Afd. B. V, p. 422, Tab. XV, fig. 37.
 1913. — — T. & A. Scott, Brit. Paras. Cop. p. 195, Pl. LXI, figs. 5, 6; Pl. LVII, figs. 13—17.
 1915. — — Wilson, Proc. U. S. Nat. Mus. Vol. 47, p. 637, Pl. 39, fig. 98.

Occurrence. — Not taken by the "Ingolf".

This species, which generally lives on the cornea of *Somniosus microcephalus*, has been taken many times at West Greenland, northwards to Port Foulke, Lat. 78°17' N. (Miers); other special localities are: Umanak, Ikerasak, Lille Karajakfjord, Ritenbenk, Godhavn, and Fiskebæ. — At East Greenland it was secured at Angmagsalik, Lat. 65°30' N., by Søren Nielsen.

At Iceland it has been taken several times; thus at North-West Iceland (Wandel) and in Dyrefjord (Feddersen); at North Iceland in Öfjord (Steincke) and at Lat. 66°36',5 N., Long. 18°06' W. (the "Thor" in 1903), at South-West Iceland near Reykjavik (Gröndal). — Finally it was secured north-west of the Færoes at Lat. 62°54' N., Long. 9°13' W. (the "Michael Sars"), and at the Færoes (Rostrup).

Distribution. — Taken some few times at Great Britain (T. & A. Scott); at Polperro, Cornwall, on *Mustelus vulgaris* (A. M. Norman). Belgium (v. Beneden); Skagerak (Olsson); Bergen (Mus. Copenhagen.)

69. *Lernæopoda Galei* Kr.

1837. *Lernæopoda Galei* Krøyer, Nat. Tidsskr. B. I, p. 272, Tab. III, fig. 5, a—f.
 1913. — *galei* T. & A. Scott, Brit. Paras. Cop. p. 197, Pl. LX, figs. 4—6; Pl. LVIII, figs. 9—15; Pl. LXIII, fig. 1.
 1915. — — Wilson, Proc. U. S. Nat. Mus., Vol. 47, p. 635.

Occurrence. — Taken a single time "south of Iceland", at the base of the genital claspers of *Scyllium canicula*. Lütken ded. 2 females.

Distribution. — Several places at Great Britain and Ireland, on "*Galeus vulgaris*, *Mustelus vulgaris*, and *Acanthias vulgaris*" (various authors). Belgium (v. Beneden, who also mentions *Trygon pastinaca* as a host); Kattegat and the North Sea near Jutland (Krøyer), Mediterranean (Richiardi).

70. *Lernæopoda Centrosyllii* n. sp.

(Pl. III, figs. 10 a—10 b; Pl. IV, fig. 1 a).

Female. — Cephalothorax nearly broader than long, with the major posterior part of each lateral margin very convex, but the front part of the head is somewhat produced, so that the lateral margin is bent inwards far before the middle; the anterior and the central parts of the surface are brownish and well chitinized, while posteriorly and at the sides the skin is thinner and light-coloured. — The trunk is oblong pear-shaped, somewhat more than twice as long as broad and only a little broader than deep; its anterior short part is much narrower than the carapace, but it is soon thickened, broadest behind the middle and posteriorly

rounded, with a pair of somewhat small, nearly ovate posterior processes about half as long as the carapace and situated rather near each other in a more ventral position than the ovisacs; the anterior part of the trunk without segmentation. — An ovisac is somewhat shorter than the trunk, with 4—5 eggs in a transverse row.

Antennulæ 4-jointed, rather short and clumsy, considerably tapering. — Antennæ broad when seen from the side (fig. 10 a), first joint much broader than long; endopod very broad and distally nearly semicircularly rounded, without armature; exopod clumsy, 2-jointed, the distal joint with two small and slender spines and one (perhaps two) proportionately large, robust and obtuse spine. — Maxillulæ of a similar structure as in *L. longicaudata* (see later on), but more clumsy, with the three terminal processes thicker and their apical setæ shorter than in the species named; the palp seems to be two-jointed. — Maxillæ considerably longer than the body and separate from base to end; each maxilla is somewhat thick at the base and decreases gradually to near the end, where it is rapidly thinner to the very short thread which terminates in a small, cupuliform, dark-brown bulla (lost in the left maxilla). — Maxillipeds originate almost in advance of the maxillæ; they are much more robust than in *L. longicaudata*, but as one among them had been mutilated it was deemed necessary not to remove the other but to draw it as well as possible (fig. 10 b) without preparation; it is seen that the proximal well chitinized joint is more than half as broad as long, with the outer margin rather convex, while the inner margin has a little before the middle a conspicuous, robust, triangular, acute process, beyond which the inner margin is somewhat concave, while proximally it is convex.

Length of the body 10 mm., the trunk 7.9 mm., the maxillæ 11.2 mm., an ovisac 5.5 mm.

Remarks. — This new species is related to *L. Galei* Kr., but differs in having the posterior processes considerably shorter and the maxillæ much longer than in that species; besides the maxillæ do not seem to have been united at the end. In general aspect it is even more similar to *Charopinus cluthæ* T. Scott, but is instantly separated in having the posterior processes ventral to the ovisacs instead of dorsal. — Male unknown.

Occurrence. — Taken only by the "Tjalfe" (Cand. mag. Ad. Jensen) at a single place.

Davis Strait: Kangerdluarsuk (Lat. 61°53' N.), 120—200 fathoms. On the head of *Centroscyllium Fabricii*; 1 female.

71. *Lernæopoda longicaudata* n. sp.

(Pl. IV, figs. 2 a—2 o).

Female. — Cephalothorax feebly inclined to the axis of the trunk, considerably longer than broad (fig. 2 b) and somewhat depressed, flattened above. — Trunk very oblong, increasing gradually in breadth to a little before the end, and the first segment is well defined; the trunk terminates in a short protuberance (fig. 2 e) with the posterior margin incurved at the middle; on each side of this protuberance a sausage-shaped process originates which is fully, or a little more than four-fifths (fig. 2 a), as long as the trunk and inserted below the ovisacs, but distinctly nearer the median line. — Ovisacs only a little shorter than the body, seen from the side with four rows of eggs.

Antennulæ (fig. 2 d, a^1) 4-jointed, rather slender excepting their first joint. — Antennæ (fig. 2 d, a^2 ; fig. 2 f) curved; the basal portion is a robust joint which is broader than long; the endopod with the distal part compressed, rather broad, bearing at least one minute spine, and its end is broadly rounded; the exopod does not reach the end of the endopod, and is two-jointed, second joint considerably shorter than the first and with at least 2 spines on the end, one of them somewhat large and curved. — The proboscis is directed considerably forwards and protrudes (p on fig. 2 d) in front of the incurved antennæ; the mouth is small (fig. 2 g), but the fringed lamella of the lower lip is somewhat broad, and the upper lip has numerous very short bristles at the margin; the proboscis has below near the fringed lamella two pairs of small, short, thick spines, the spines on the same half sitting close together and rather distant from the two other spines. — Maxillulæ (fig. 2 g) well developed, each with three processes terminating in moderately short, strong setæ; the palp is well developed, two-jointed, with 3 small spines on the end. — The maxillæ are extremely interesting; in the largest specimen (with ovisacs) they have lost a distal part, but the part preserved is more than two and a half times as long as the body (fig. 2 a), while in the smaller specimen they are scarcely half as long again as the body. In the ovigerous specimen they are coalesced on their inner side in more than $\frac{5}{6}$ of their length — on the lost terminal part nothing can be said —; in the other specimen (fig. 2 b) their proximal and their most distal parts are separated, while they are coalesced in the major part of their length; the thread bearing the bulla is short and consists distinctly of two coalesced threads; the bulla (fig. 2 b) is of moderate size and shaped as a circular disk with both sides convex excepting towards the margin, as the marginal part of the bulla is quite thin. — Maxillipeds rather small (fig. 2 c), inserted between and a little behind the maxillæ; their first chitinized joint (fig. 2 h) is more than two and a half times as long as broad, with the inner margin curiously sinuate, showing a more proximal somewhat feeble impression and much beyond the middle a rounded incision with a small but robust and curved, acute process (fig. 2 i); the inner margin between these two incurved parts and between the distal incision and the claw shows a most peculiar structure, which to some degree may remind one of the surface of a file; the "claw" is two-thirds as long as the preceding joint and consists of a slender joint which has a small but strong, curved spine on the lower surface towards the outer margin and a little from the base; this joint is twice as long as the real claw which has a minute spine on its concave margin rather near the base; a fine, somewhat short spine is inserted below the claw.

Measurements. — The ovigerous specimen has the body 11.3 mm. long, the trunk 7.6 mm., the posterior processes 6.7 mm., the preserved part of the maxilla 28.7 mm., the ovisacs 8.4 mm. In the other specimen the body is 9 mm., the trunk 6.5 mm., the maxillæ 13 mm., the posterior processes 6.5 mm.

Male. — Body, seen from the side (fig. 2 k) somewhat slender and very moderately curved at the middle. Carapace well defined. Trunk divided into five very distinct segments, about as long as the carapace. The caudal rami even a little longer than the two posterior segments together, slender, nearly spini-form and a little curved.

Antennulæ 4-jointed, slender. — Antennæ a little shorter than the antennulæ (fig. 2 k); basal joint short (fig. 2 l); endopod oblong-ovate, with at least 2 small spines remote from the rounded end; exopod considerably longer than the endopod, seemingly 3-jointed, but the first joint proximally imperfectly marked

off; third joint conspicuously broader than long, increasing in breadth from base to end, its terminal margin is partly concave, with a long, strong, curved spine on the anterior angle so that a kind of imperfect chela is formed; a small and thin spine is inserted on the end close at the strong spine mentioned. — Maxillulæ (fig. 2 m) in the main as in the female, differing especially in having the apical robust setæ on the three terminal branches rather long, and the palp seems to be unjointed. — Maxillæ (fig. 2 n) with first joint extremely broad, at the inner margin terminating in a triangular, robust process with its inner margin and the end serrate; the "claw" is robust, extremely broad at the base, and its terminal portion is strongly curved, lying on the posterior side of the process mentioned. — Maxillipeds (fig. 2 o) with the proximal, well chitinized joint somewhat flattened and consequently considerably broader than thick, and besides nearly twice as long as broad; it increases considerably in breadth from the base to much beyond the middle; the major part of its outer margin is rather convex, and at the distal part of the inner margin two very small, sharp protuberances are found; the inner, distal corner is produced into a strong, oblong-triangular, acute process; the claw is very robust, very thick at the base, and its distal half is extremely curved. — Each of the two anterior segments of the trunk has a pair of minute legs, a little longer than broad, and with a single seta or two small setæ on the end.

Length of the single male 1.93 mm. (caudal rami not included).

Remarks. — This fine species is in general aspect rather similar to *Lernæopoda longibranchiata* Brian, by Wilson referred to his genus *Lernæopodina*. But it is instantly distinguished from Brian's species in having the posterior processes ventral to the ovisacs, while they are dorsal to the genital openings in the genus *Lernæopodina*. The female of the new species agrees with *Lernæopoda* as characterized by Wilson; the male differs not only from the genus but from nearly all genera of the family in possessing two very distinct pairs of legs on the trunk. The difference between the two females hitherto known as to length and development of the maxillæ is most noteworthy.

Occurrence. — Not taken by the "Ingolf" but by the "Thor" and the "Michael Sars" at the following places, in both cases on *Centrophorus squamosus*.

South of Iceland: Lat. 63°05' N., Long. 20°00' W., 920 m; the "Thor" (Dr. Johs. Schmidt), July 16, 1903. One female without ovisacs at the pectoral fins of the host.

South-West of the Færoes: Lat. 61°07' N., Long. 9°33' W., 400 fathoms; the "Michael Sars" (Cand. mag. Ad. Jensen), Aug. 14, 1902. One female with ovisacs and a male.

72. *Lernæopoda Sebastis* Krøyer.

1863. *Lernæopoda Sebastis* Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 353, Tab. XVII, fig. 7, a—h.

Krøyer had two mutilated females; the poor condition of the preserved fragments of these specimens makes it impossible to add anything to his description or figures, and the species has never been found again.

Occurrence. — Krøyer had 2 females from West Greenland; he found them in the branchial cavity of *Sebastes marinus*.

Lernæopodopsis n. gen.

Body of the female divided by a very recurved dorsal line, somewhat behind the insertion of the maxillæ, into cephalothorax and trunk (fig. 3 a). In advance of the front margin of the base of the maxillæ the cephalothorax is produced much forward as a very oblong triangle with the front end narrow and obtuse (figs. 3 a—3 b); the maxillipeds originate near the middle between the front end and the origin of the maxillæ, while the other appendages are extremely small and arranged close together at the narrow front end. — The trunk terminates in a pair of small tubercles.

Antennulæ (a^1), seen from below (fig. 3 d), originate below and slightly behind the antennæ; they are a little shorter than the antennæ, 2-jointed. — The antennæ (figs. 3 c and 3 d, a^2) are essentially projected along the sides of the proboscis; they are biramous, but both rami are simple, short, broad and rounded, without spines. — The proboscis is very thick and directed horizontally forwards, so that the mouth with its rather broad, fringed lamella is terminal on the head. — The maxillulæ (fig. 3 d, mx') as usual on the sides of the oral cone; each maxillula is an oblong plate with two minute, setiferous knots on the terminal margin. — The maxillæ are very long (fig. 3 a), fused along the major distal part and terminating in a single bulla. — Maxillipeds (fig. 3 e) consist of a large, oblong, thin-skinned part, on the end of which the extremely small well chitinized elements are found, viz. an oblong joint and the claw-shaped portion.

Remarks. — Of the new species, on which this genus is founded, only the female is known. It has at first sight a considerable likeness to forms of the genera *Lernæopoda* and *Lernæopodina*, but a closer investigation shows that it occupies an isolated position within the family. The strongly produced, triangular head with the extremely small appendages is very curious; the antennulæ and especially the maxillipeds are very interesting.

73. *Lernæopodopsis producta* n. sp.

(Pl. IV, figs. 3 a—3 e).

Female. — The cephalothorax may be said to possess a moderately developed carapace, which posteriorly terminates in a very convex margin situated somewhat behind the origin of the maxillæ; it is a little more than twice as long as broad and in the median line about as long as the trunk. The head in advance of the anterior margin of the base of the maxillæ is somewhat more than half as long again as broad, oblong-triangular. — The trunk is somewhat depressed, about twice as long as broad, with the lateral margins feebly convex; the end is broadly rounded without any real processes, but at the middle a little incised between a pair of quite small protuberances. — No ovisacs.

The antennulæ (fig. 3 d, a^1) are 2-jointed; the first joint is very oblong, considerably longer than and twice or three times as thick as the second, which is very slender and terminates in a moderately long seta. — Antennæ, proboscis, and maxillulæ are mentioned sufficiently in the description of the genus; figs. 3 c and 3 d may convey a full idea as to various particulars. — The maxillæ are nearly more than twice as long as the entire body; they originate on the sides of the cephalothorax, proceed forwards and from somewhat in front of the mouth they are completely fused; towards the end the appendage formed by that fusion is gradually acuminate to the moderately short and thin thread which terminates in a minute bulla of normal

shape. — The maxillipeds (figs. 3 b and 3 e) originate a little longer from the proboscis than from the maxillæ; as already mentioned each maxilliped is situated on the end of a large, oblong, subconical part, which looks somewhat thin-skinned, projects freely forwards and contains muscles (shown in fig. 3 e); the first well chitinized joint is very small, oblong, broadest at the middle; second joint is slender and terminates in a normal claw, below which an accessory short spine is observed.

Length of the body 5.1 mm., of the maxillæ 10.5 mm.

Remarks. — This is the most interesting species among the new forms of parasites from the "Ingolf" area; in the remarks on the genus reference is made as to the most deviating features.

Occurrence. — Secured by the "Ingolf" at a single station.

Davis Strait: Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fathoms, temp. 3°.6; 1 female firmly fixed on a scale on the front of *Macrurus Fabricii*.

Brachiella Cuvier.

Of this genus only a single species has hitherto been found in the "Ingolf" area, but some two or three of other forms taken at Scotland may probably later be found at the Færoes.

74. *Brachiella rostrata* Krøyer.

1837. *Brachiella rostrata* Krøyer, Nat. Tidsskr. B. I, p. 207, Tab. II, fig. 1.

1863. — — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 364, Tab. XVII, fig. 8, a—f.

1913. — — T. & A. Scott, Brit. Paras. Cop. p. 205, Pl. XLV, fig. 8; Pl. LXII, fig. 3; Pl. LXIII, figs. 2—8.

1915. *Parabrachiella rostrata* Wilson, Proc. U. S. Nat. Mus., Vol. 47, p. 714, Pl. 28, fig. O; Pl. 56, figs. 249—255.

Occurrence. — Not taken by the "Ingolf".

This species lives on the gills of *Hippoglossus vulgaris* and *H. pinguis*. It has been taken several times at West Greenland; special localities are Godhavn, Lat. 69°14' N. (Oirik), and Julianehaab, Lat. 60°43' N. (Rev. P. H. Sørensen).

Distribution. — Shetland (Wilson); North Sea (T. & A. Scott); Roscoff (C. Vogt); Storeggen, west of Norway (Olsson); Kattegat (Krøyer). Finally Woods Hole region, Mass. (Mary Rathbun) and Georges Banks (Wilson).

Clavella Oken.

(*Anchorella* Cuvier, Krøyer).

This genus taken in the sense of T. & A. Scott (1913) comprises 5 species from our area, and 2 among them are new, found on deep-sea fishes. In 1915 Wilson divided the genus into 4 genera, using especially characters drawn from features in the anterior free appendages, viz. whether the antennæ are uniramous or biramous, the maxillulæ bipartite or tripartite, the antennulæ 3-jointed or 4-jointed. While the two first-named characters are always sharp, the joints in the antennulæ are sometimes difficult or perhaps impossible to count with certainty. My two new species have the antennæ biramous and therefore they cannot belong

to *Clavella* sens. Wilson; but they do not agree well with any of his new genera. Instead of establishing any new genus I prefer in the present paper to keep all 5 species in the old genus *Clavella*, without thereby indicating any positive criticism of Wilson's grouping. I am, however, apt to think that the study of a very large number of females and males of described and undescribed species may show that it will be very difficult to subdivide *Clavella* sens. Scott into several natural and sharply defined genera.

75. *Clavella uncinata* O. F. Müll.

(Pl. IV, figs. 4 a—4 l).

1776. *Lernæa uncinata* O. F. Müller, Zool. Danicæ Prodrömus, p. 226.
 1777—79. — — O. F. Müller, Zool. Danica, I, p. 38, Tab. XXXIII, fig. 2.
 1837. *Anchorella* — Kröyer, Nat. Tidsskr. B. I, p. 290, Tab. III, fig. 8, a—f.
 1863. — — Kröyer, Nat. Tidsskr. 3. Række, B. II, p. 384.
 ! — — *agilis* Kröyer, op. cit. p. 374, 384, Tab. XVI, fig. 2, a—b.
 1913. *Clavella uncinata* T. & A. Scott, Brit. Paras. Cop. p. 214, Pl. LXV, figs. 2, 3, 6; Pl. LXVI, figs. 21—23.
 !1915. — — Wilson, Proc. U. S. Nat. Mus. Vol. 47, p. 680, Pl. 27, fig. M.; Pl. 48, figs. 167—173; Pl. 49, figs. 174—176.

T. & A. Scott say: "Abdomen small but quite distinct"; Wilson states (p. 681) "genital process . . . minute"; and the protuberance interpreted as "genital process" by Wilson has been named "abdomen" by probably all earlier authors. Kröyer writes (1863) on his *A. uncinata*: "abdomen sat magnum, quartam fere longitudinis annuli genitali partem attingens, longius quam latius", and on his *A. agilis*: "abdomen minutum, haud longius quam latius, obtuse conicum". Judging from these statements one might suppose that *C. agilis* Kr. is sharply defined from *A. uncinata* auct., and that the animals described by Scott and Wilson as *C. uncinata* in reality belong to *C. agilis*. The inspection of my rich material enumerated below showed that all specimens taken on the branchiæ or in the mouth of various Gadidæ at Iceland and West Greenland have a rather large or large genital process, which, however, is not always longer than broad. But on a branchia of *Gadus saïda* Lep. (= *G. agilis* Reinh., Kröyer) from East Greenland 11 specimens are found, 4 among them with ovisacs, the others smaller or only half-grown, but the genital process varies considerably in size, from moderately large to somewhat small. In specimens taken on dorsal, pectoral or ventral fins of *Gadus callarias* and *G. ogac* at three places in West Greenland the genital process is small or moderately small, shorter or much shorter than broad. In specimens taken at West Greenland but without statements whether found on gills or fins, the genital process varies much in size and in length in proportion to breadth, and that even in animals preserved in the same tube and probably taken together. To refer the specimens seen to two different species according to size and shape of the genital process I found to be impossible.

The front margin of the head is transverse, nearly straight or slightly concave. — The antennulæ are indistinctly 3-jointed, terminating in 3 moderately long and 1 or 2 short and thick spines; first joint is very thick and nearly as long as the two distal joints together. — The antennæ are nearly parallel with

the front margin of the head, two-jointed; the second joint is about as broad as, or distinctly more narrow than, the first, and distally very broadly rounded. In several specimens taken respectively on gills or fins of various species of *Gadus*, on *Sebastes*, *Macrurus* and *Somniosus* I found generally 3, sometimes 2, somewhat setiform spines placed near each other on the upper surface of the distal joint somewhat from its terminal margin (figs. 4 a and 4 e), and these spines are rather large in proportion to the minute spines or prickles found on a part of the same joint. In a specimen from gills of *G. callarias* and possessing a large genital process numerous prickles were found (fig. 4 a) on the distal surface of the joint and some also near its inner margin towards the base; in a specimen with a small genital process and taken on a fin of *G. ogac* only a quite low number of prickles could be discovered (figs. 4 d and 4 e). Consequently I hoped to be able to separate two species by the different equipment with prickles on second antennal joint, but the study of specimens from other places gave the result that the idea must be abandoned. In specimens taken on *G. merlangus*, on *Sebastes*, *Macrurus* (see later on) and *Somniosus* the second antennal joint had a good number of prickles. — The maxillulæ have been examined in a specimen with the genital process rather large, the distal joint of the antennæ with numerous prickles, and taken on the gills of *G. callarias*. Each maxillula (fig. 4 b) is bipartite and has on the posterior side a rudimentary palp terminating in two small spines, thus in the main agreeing with Scott's figure. — The shape of first joint of the maxillipeds (fig. 4 c) is rather characteristic; the second slender joint, which constitutes the longer proximal portion of the "claw", has always a very distinct spine on the lower side somewhat from the base.

On the branchiæ of a small *Macrurus Fabricii* (taken by the "Ingolf") I found a small and clumsy form (fig. 4 f), which to begin with I believed to be a new species. But a closer investigation of antennæ and maxillipeds of one of the 3 specimens revealed so full agreement with the same appendages in typical specimens from branchiæ of *Gadus*, that I was forced to refer the specimens to *C. uncinata*. Fig. 4 f shows the general aspect of one of the specimens; fig. 4 g the front margin with both antennæ of the same animal; figs. 4 h and 4 i the distal joint of left antenna respectively from above and from below. Its measurements are: cephalothorax 2 mm., trunk (without genital process) 1.5 mm., ovisac 1.4 mm.

The male of *C. uncinata* is on the whole well known. Fig. 4 k exhibits the oral cone and left maxillula, which differs a little from that in the female; fig. 4 l represents the left maxilla.

Occurrence. — Taken by the "Ingolf" at three places.

Holstensborg, Lat. 66°56' N., on the pectoral and ventral fins of *Gadus ogac*; 23 females.

Davis Strait: Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fathoms, temp. 3°.6; 3 females on the gills of a small *Macrurus Fabricii*.

North-West Iceland: Isafjord, on the tongue and in the mouth of *Gadus virens*; 2 females; besides on the gills of *G. callarias*, 1 specimen.

At West Greenland this species has been taken several times especially on branchiæ of *Gadus callarias* and *G. ogac*; special localities are: Umanak, Ikerasak and Julianehaab. At Holstensborg 5 specimens were gathered on *Sebastes marinus* by the colonial director Brummerstedt. — At East Greenland it was taken in Danmarks-Havn, Lat. 76°45' N., on the branchiæ of *Gadus saida* by the zoologist Fritz Johansen.

At Iceland it is common. It has been taken at North-West Iceland in Önundarfjord on branchiæ

of *G. callarias* and *G. æglefinus*, in Dyrefjord on a fin of *G. æglefinus* by Mag. sc. W. Lundbeck; at South-West Iceland it was gathered in Grindavik by Mag. sc. Sæmundsson; at the eastern coast of Iceland by Wiinstedt; finally at Iceland (without special locality) on *Somniosus microcephalus* by Vice-Admiral Wandel. — At the Færoes it has been taken on *G. callarias* and on the operculum of *G. merlangus* by Syssemand Müller.

Distribution. — "Tolerably common" at Great Britain and Ireland (T. & A. Scott). At Denmark through the whole year nearly on every rather large specimen of *Gadus callarias* (Krøyer); Bohuslän, Skager Rak, Bergen, Aalesund, on forms of the genus *Gadus* (Olsson); Belgium (v. Beneden); Roscoff (C. Vogt); Brian (1898) states that it has been found at Genova on *Sargus Rondeletii*. Wilson records it from localities at Maine, Massachusetts, Georges Banks, etc. and from Alaska.

76. *Clavella Stichæi* Kr.

(Pl. IV, figs. 5 a—5 b).

1863. *Anchorella Stichæi* Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 372, 384, Tab. XVI, fig. 1, a—g.

1886. — — Hansen, Dijnphna-Togtets zool.-bot. Udbytte, p. 267, Tab. XXIV, fig. 1, a—g.

Female. — The general aspect of this small form has been well characterized by Krøyer. Cephalothorax somewhat or, generally, considerably longer than the ovate trunk. The front margin of the head convex towards the lateral margins and its major middle part straight.

The antennulæ are 3-jointed (fig. 5 a); the first joint is rather thick and about as long as the third, on the inner distal angle with an oblong protuberance terminating in a minute spine; third joint terminates in 3 spines differing in length and thickness. — Antennæ uniramous, oblong-conical, a little curved and directed much inwards and somewhat forwards; an articulation could not be discovered, and the end is more or less obtuse and seemingly rather thinly chitinized. Maxillulæ bifid, on the posterior margin with a short and slender palp terminating in a spine. — Maxillæ have the peculiarly striated bulla well described by Krøyer. — Maxillipeds have the first joint (fig. 5 a) proportionately longer than in *A. uncinata* and differing in outline; second joint as in the last-named species with a short, thick spine on the lower side a little from the base.

Male. — An extremely small, probably old specimen is drawn (fig. 5 b); it is only 0.23 mm. long, the oral cone included. The appendages occupy about two-thirds of the median ventral line; the two posterior pairs are very large, with their first joint extremely robust. — The antennulæ are 3-jointed, the two distal joints subequal in length, each somewhat shorter and thinner than the first, and the third terminates in 3 more or less setiform spines. — The antennæ biramous; in the sympod only one joint could be discerned; the exopod is two-jointed and terminates in a couple of small spines, while the endopod is undivided with the end rounded and without any seta. — The maxillulæ are normal, with a minute palp terminating in a seta.

Remarks. — In 1886 I described the male on specimens from the Kara Sea. The specimen figured was larger than that just described, viz. about $\frac{1}{3}$ mm., which was due to the fact that the body behind the maxillipeds was considerably larger. I stated that the antennulæ were 4-jointed, but I had evidently made the mistake to interpret a thick and curved terminal spine as a fourth joint. Furthermore I described the

antennæ as having the posterior ramus 3-jointed, the anterior 2-jointed; these statements may possibly be erroneous but I have not re-examined any specimen.

Occurrence. — Secured by the "Ingolf" at a single station.

Davis Strait: Stat. 31: Lat. $66^{\circ}35'$ N., Long. $55^{\circ}54'$ W., 88 fathoms, temp. $1^{\circ}.6$; 2 specimens on the pectoral fins and 1 specimen on the lower side of the head of *Lycodes VahlII* Reinh.

At West Greenland this species has been taken a few times. Krøyer had a good number of specimens from *Stichæus punctatus*, especially from the inner side of the pectoral fins, but he does not give any special locality. On a young specimen of *Lycodes reticulatus* taken in the Disco Bay (Lat. $68\frac{1}{2}^{\circ}$ — 70° N.), 200 fath., 4 females with males were found by Prof. Lütken (see "Dijmphna-Togtet" p. 137—138 and p. 269). At Sukkertoppen, Lat. $65^{\circ}25'$ N., was captured a specimen of *Lumpenus maculatus* with a single female. — Furthermore the parasite has been taken by Mag. sc. W. Lundbeck at North-West Iceland in two places, viz. in Önundarfjord, 4 females with 3 males on the inner side of the pectoral fins of *Lumpenus maculatus*, and in Dyrefjord on the same fins of the same species.

Distribution. — Recorded from the Kara Sea on *Icelus hamatus* and on *Lycodes Rossi* Malmgr. (= *L. Lütkeni* Lütk. nec Collett); all specimens on the inner side of the pectoral fins of these fishes (H. J. Hansen).

77. *Clavella Macruri* n. sp.

(Pl. IV, figs. 6 a—6 f).

Female. — Rather large, slender, glabrous. Cephalothorax a little longer than the trunk, curved and besides at the base a little recurved towards its dorsal side; head not marked off or enlarged, its front margin transverse. — Trunk very oblong and somewhat depressed, between twice and three times as long as broad, posteriorly broadly rounded without any protuberance. — Ovisacs somewhat longer than the trunk, rather slender, with numerous small eggs.

Antennulæ (fig. 6 b) seemingly 4-jointed, the first joint very thick and not very distinctly marked off from the second; terminal joint with a single curved spine. — Antennæ (fig. 6 c) as usual bend much inwards, through not parallel with the front margin; endopod large, not marked off from the sympod by any distinct suture or articulation, scarcely as broad as long, broadly rounded without hairs or spines; exopod very small as compared with the endopod, terminating in one thick and one thin spine, seemingly one-jointed, but the contents within the skin indicate a quite short proximal and a much longer distal joint. — The oral cone short; maxillulæ bifid, normal, but a palp could not be observed with real certainty and seems to be quite rudimentary. — Maxillæ moderately long; bulla black, seen from the side shaped nearly as an inverted, somewhat short, robust, a little curved spine (fig. 6 a) which has its end in the maxillæ, while the broad base is very oblique and firmly fixed in a fin-ray. — Maxillipeds (fig. 6 d) with first joint twice as long as thick and decreasing in breadth from somewhat from the base to the end; second joint unusually slender, and a spine could not be discovered on its lower side; claw somewhat long, strong, and below it a small spine.

Length of cephalothorax of the specimen figured 7 mm., its trunk 6.5 mm., and an ovisac 7.3 mm.

Male. — Seen from the side (fig. 6 e) the body is intermediate in shape between *Clavella uncinata* and *C. rugosa*, though nearer to the last-named form, as the ventral line of the body between its posterior

end and the base of the maxillipeds is not much shorter than the dorsal line from the base of the proboscis to the posterior end. — The antennulæ (fig. 6 f) are 3-jointed, with a spine on the posterior side of second joint, while third joint has 3 long, terminal spines, the median one very thick. — Antennæ (fig. 6 f) with the rather long sympod 2-jointed; endopod not marked off, unjointed, without any spine; exopod 2-jointed with a minute terminal spine. — Maxillulæ (fig. 6 f) normal; the palp somewhat short and slender, with a well developed terminal spine. — Maxillæ and maxillipeds of moderate size, proportionately smaller than in *Clavella uncinata* or *C. Stichæi*.

Length 0.55 mm. (proboscis not included).

Occurrence. — Taken on rays of the anal fin of specimens of *Macrurus* secured by the "Ingolf" at two stations.

Davis Strait: Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fathoms, temp. 3°.6; 2 fine females (one with a male) on the distal part of the anal fin of a large *Macrurus Fabricii*.

— — Stat. 27: Lat. 64°54' N., Long. 55°10' W., 393 fathoms, temp. 3°.8; 1 female at the end of a ray in the anal fin of *M. Fabricii* or *M. rupestris*.

78. *Clavella gracilis* n. sp.

(Pl. IV, figs. 7 a—7 f).

Female. — Very small and extremely slender. Cephalothorax even more than twice as long as the trunk and recurved along its dorsal side; it decreases somewhat in thickness from base to end; the head is not marked off and not enlarged; the middle part of the front margin somewhat convex. — The trunk is slender, distinctly depressed, with the posterior margin nearly straight and no vestige of any protuberance. — Ovisacs distinctly or considerably longer than the trunk, with two longitudinal rows of eggs or sometimes (fig. 7 a) in their proximal part with a single row.

Antennulæ (fig. 7 b) 3-jointed, with first joint thick, second somewhat shorter than the first, the third slightly longer than the two others together and terminating in a hook. — Antennæ (fig. 7 c) turned somewhat inwards, biramose; exopod about as long as the sympod, 2-jointed, first joint considerably thicker and much longer than the second, which terminates in two small spines; endopod undivided, obliquely expanded, broader than long, and without equipment. — The proboscis moderately long, reaching slightly beyond the antennæ when these are bent inwards; the terminal striated membrane is rather broad. — Maxillulæ (fig. 7 d) with the two terminal processes rather short, unequal in length and each terminating in a seta; the palp minute, spiniform. — Maxillæ (fig. 7 a) extremely short; a bulla in the usual sense does not exist, but a dark-brown thread, which is round at the base and then somewhat enlarged or thickened to far beyond the middle or to near the end, is more than half as long as the trunk. — Maxillipeds (fig. 7 e) somewhat long; first joint considerably more than twice as long as broad, with the distal oblique margin sinuate; second joint armed below somewhat from the end with a spine; a curved spine or accessory claw is very distinct.

Length of cephalothorax 2.6 mm., of the trunk 1.2 mm., of an ovisac 1.24 mm.

Male. — The single specimen seen is 0.26 mm. long. The body (fig. 7 f) seen from the side is ovate, and the appendages occupy scarcely half of the length of the ventral line. — Antennulæ 3-jointed; third joint much longer than any of the two others and terminating in 3 spines of different length. — The sympod of the antennæ indistinctly 2-jointed; exopod 2-jointed and terminating in 2 short spines; endopod one-jointed, without spine. — Maxillulæ as in the female excepting that its two branches are proportionately longer. — The maxillæ and the maxillipeds well-sized and robust, though proportionately smaller than in *C. Stichæi*.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 35: Lat. 65°15' N., Long. 55°05' W., 362 fathoms, temp. 3°.6; 10 females and 1 male on the distal part of the anal fin of *Polyacanthonotus rostratus* Collett.

79. *Clavella rugosa* Krøyer.

1837. *Anchorella rugosa* Krøyer, Nat. Tidsskr. B. I, p. 284, Tab. II, fig. 7; Tab. III, fig. 14, a—c.

1863. — — Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 383.

1893. *Clavella* — T. & A. Scott, Brit. Paras. Cop. p. 216, Pl. LXV, figs. 4, 5; Pl. LXVI, figs. 1—7.

1895. *Clavellodes* — Wilson, Proc. U. S. Nat. Mus. Vol. 47, p. 690, Pl. 27, fig. 1; Pl. 51, figs. 190—199.

Occurrence. — Not taken by the "Ingolf".

C. rugosa lives on the gills of *Anarrhichas lupus*, *A. minor* and *A. latifrons*. — At West Greenland it has been taken a few times; the only special locality noted is Egedesminde (Olrik). — At Iceland it has been found (on *A. latifrons*) by Hallgrímsson; at North-West Iceland in Önundarfjord and in Dyrefjord (many specimens) by Mag. sc. W. Lundbeck; at North Iceland in Öfjord by Möller. — At the Færoes it has been secured by Syssemand Müller.

Distribution. — T. & A. Scott record localities from the north-eastern Ireland, from both sides of Scotland and from the east coast of the northern England. It is recorded from Belgium by v. Beneden, from the southern Kattegat by Krøyer, from the Sound and from Warberg (east side of Kattegat) by Olsson. Finally from Casco Bay, Maine, by Wilson.

Family Choniostomatidæ.

Since my monograph¹ of this family was published, rather little has been added to our knowledge of these generally small or minute parasites infesting Crustacea of various orders. Three papers may be briefly named, viz. two by T. Scott on rare or new Crustaceous (in Reports Fishery Board for Scotland for the years 1904 and 1905), and H. J. Hansen: Two new Forms of Choniostomatidæ . . . (Quart. Journ. Microsc. Science, Vol. 48, II, p. 347—358, Pl. 22). The last-named treatise is noted here because it contains the description of a new genus found on the Ostracod *Sarsiella hispida* Brady from Akaroa Harbour, New Zealand, as it may perhaps be possible to discover allied parasites on the body of some boreal or arctic Ostracods. In the present paper no less than 18 species from the "Ingolf" area are mentioned, 8 of which are new to science; all of them live on Decapoda, Amphipoda, Isopoda or Cumacea, while no specimen of the two genera parasitic on My-

¹ H. J. Hansen: The Choniostomatidæ. A Family of Copepoda, Parasites on Crustacea Malacostraca. Copenhagen 1897. 4to.

sidacea, viz. *Mysidion* H. J. H. and *Aspidoccia* Giard & Bonn., has hitherto been found within our area, but it may be probable that they can be discovered there in the future. — As the Amphipoda gathered by the “Ingolf”, the “Thor” etc. have not been worked out, it is also highly probable that some forms not recorded here may be found on the material.

Stenotocheres H. J. H.

Of this interesting genus only 2 species are known, one of which was established on specimens from our area.

80. *Stenotocheres egregius* H.J.H.

1897. *Stenotocheres egregius* H. J. Hansen, Choniostomatidæ, p. 89, Pl. I, figs. 1 a—11.

1904. ? — — T. Scott, Twenty-second Rep. Fish. Board Scotland Pt. III, p. 251, Pl. XV, figs. 5—10.

It seems to me to be somewhat uncertain whether the female described by Scott and captured on *Metopa borealis* G. O. S. from Aberdeen Bay really belongs to *S. egregius*, as according to his description and figures of the antennæ and the two pairs of thoracic legs these appendages do not agree in several particulars with my representation of the same parts.

Occurrence. — “On *Metopa Bruzelii* (Goës) from two localities near the western coast of Greenland”, viz. “Godthaab, deep water [probably 40—60 fathoms], in *Sertularia*, Holböll”, and in Davis Strait: Lat. 66°30' N., Long. 54°50' W., 40 fathoms, Th. Holm leg.

Homoeoscelis H. J. H.

The species of this genus live in the branchial chambers of Cumacea. Only 2 species have been found within our area, and both are new to science.

81. *Homoeoscelis frigida* n. sp.

(Pl. V, figs. 1 a—1 g).

Female. — The largest specimen is 0.93 mm. long and 0.72 mm. broad; the specimen drawn (fig. 1 a) is 0.79 mm. (caudal rami not included). — The front margin of the head (fig. 1 c) is regularly convex without incisions, and fringed with many extremely short hairs. — Antennulæ 2-jointed, as in the two species described in my work; antennæ wanting; and maxillulæ without additional branch, palp, as in the other forms. — Maxillæ with second joint plus claw somewhat long. — Maxillipeds rather long; first joint moderately robust, more than half as long as the proximal transverse diameter of the head, and with a number of fine, partially very short hairs at the end, especially at its inner angle; second joint slightly longer than the slender and feebly curved claw, and with a rather short but thick and a little biramose spine below the claw.

Trunk ovate, depressed, on the anterior fourth part with numerous hairs and more posteriorly the clothing is gradually thinner, so that it nearly disappears towards the caudal rami. The two pairs of thoracic legs considerably longer than in my two earlier species, but they are much shorter than the caudal rami, and distinctly shorter than the breadth of the head. Fig. 1 d exhibits the genital area and the caudal rami;

it was impossible to discern any well chitinized arch encircling behind and on the sides the genital apertures, but the figure shows the stripe between the genital apertures clothed with numerous fine hairs, furthermore that outside each genital aperture is found a stripe which proceeds backwards to outside the caudal ramus and turns inwards behind it, and this stripe is clothed with fine hairs; finally the figure shows that the caudal rami in the specimen investigated differ from one another, as one of them is simple, while the other has a secondary branch which originates from the thickened basal portion and is almost half as long as the main branch; both the rami and the secondary branch are pubescent towards the end.

Ovisacs (fig. 1 b). — They are nearly globular, middle-sized, with few and proportionately large eggs; the diameter of the ovisac figured (with the ova a little oblong) is 0.36 mm.

Larva. — Several well developed specimens prepared out of their egg-membranes are to hand; the total length (caudal rami included) is 0.25 mm. They agree not only in general aspect but in most features with those of the two species described in 1897, thus in the length of the sensory seta on the antennulæ, in extraordinary length and special structure of the antennæ (fig. 1 e), in the maxillæ (fig. 1 f) and in the abdominal segments. But the maxillipeds (fig. 1 g) show marked differences; they are unusually long, as their proximal joint, which is nearly as long as the remainder of the maxilliped, is not only very much longer than the distance between maxillæ and maxillipeds, but even almost half as long as the cephalothorax; besides the claw is marked with about 6 slender spines along its concave margin. — Second abdominal segment about as long as the first. The longest seta on the caudal rami uncommonly long, even a little more than half as long as the whole body.

Occurrence. — This parasite lives in the branchial chambers of *Diastylis polaris* G. O. S., and has been secured by the "Ingolf" at two of its deepest stations in the cold area.

South of Jan Mayen: Stat. 117: Lat. 69°13' N., Long. 8°23' W., 1003 fathoms, temp. ÷ 1°0;
1 female and 4 ovisacs in the right branchial chamber of an adult female
of *D. polaris*.

— - — — Stat. 113: Lat. 69°31' N., Long. 7°06' W., 1309 fathoms, temp. ÷ 1°0;
in the right branchial chamber of a female *Diastylis* 1 female and 2
ovisacs, and the same number in the left gill-chamber.

82. *Homoeoscelis longipes* n. sp.

Of this new species the material comprises 1 adult female, 1 male and an irregularly shaped lump of ova, but both animals were found so misshapen by pressure that it is impossible to give a complete description or tolerably accurate drawings. But being able to point out some features I think that the species can be recognized with certainty, especially when the interesting host is taken into account, as no Choniostomatid has hitherto been found on any specimen of the small forms belonging to the genus *Leptostylis*.

Female. — The body in its natural shape has been about 0.44 mm. long. Hairs could not be perceived on any part of the animal. The head with its appendages does not seem to exhibit any noteworthy differences from that in *H. mediterraneus* H. J. H. The thoracic legs are long and excepting towards their base uncommonly thin, the first leg is even distinctly longer than the proximal breadth of the head and

only a little shorter than the caudal rami which also, and especially beyond the middle, are very thin; pubescence on the distal part of legs and caudal rami not discoverable. The genital area as in *H. mediterranea* encircled by a narrow, chitinized, transverse ring broadly open in front; as I have not cut off the posterior end of the body and cleaned it from the inside I cannot positively deny the possibility that some part of the genital area may be equipped with fine hairs, though it was impossible to discover any such clothing.

Male. — Closely allied to *H. mediterraneus* as to clothing, naked front margin of the head, etc. In the 2-jointed antennæ the second joint is considerably longer than the first. Thoracic legs distally very thin as in the female and very long, almost one-fourth as long again as the distance between the front margin of the head and the origin of the maxillipeds; pubescence not perceptible. The caudal rami somewhat shorter than the thoracic legs, but otherwise similar to them in all particulars. — The specimen seems in normal state to have been at most 0.16 mm. long.

Occurrence. — Not taken by the "Ingolf" but by the "Thor" at a single place.

West of South Iceland: Lat. 63°46' N., Long. 22°56' W., 150 met., temp. 7°28; in the right branchial chamber of an immature male of *Leptostylis villosa* G. O. S. 1 female, 1 male, 1 lump of eggs.

Sphæronella Salensky.

Of this very rich genus 13 species are mentioned here from our area, and 6 among them are new to science. It may be practical to arrange them according to their hosts.

A. Parasites on Amphipoda.

83. *Sphæronella Argissæ* H. J. H.

1897. *Sphæronella Argissæ* H. J. Hansen, Choniostomatidæ p. 123, Pl. IV, figs. 3 a—3 n.

Occurrence. — Only the specimens mentioned in the paper quoted are known. The species lives on *Argissa typica*, and the material was found on specimens from West Greenland, without special locality. In a marsupium was found 1 female, 2 males, 1 larva and 4 ovisacs; in an immature specimen was found 1 pupa, and in another immature specimen a recently hatched female. (For further particulars see op. cit. p. 125).

84. *Sphæronella Metopæ* H. J. H.

1897. *Sphæronella Metopæ* H. J. Hansen, Choniostomatidæ, p. 125, Pl. IV, figs. 4 a; Pl. V, figs. 1 a—1 g.

Occurrence. — "The marsupium of *Metopa Bruzelii* (Goës) from West Greenland off Godthaab, "deep water" [probably 40—60 fathoms], in *Sertularia*, C. Holböll". On 3 infested female Amphipoda 3 females, 1 male and several ovisacs (further particulars l. c. p. 127).

85. *Sphæronella Holbølli* H. J. H.

1897. *Sphæronella Holbølli* H. J. Hansen, Choniostomatidæ, p. 127, Pl. V, figs. 2 a—2 g.

Occurrence. — "The marsupium of *Paramphithoe Boeckii* H. J. H. from West Greenland off Godthaab, "deep water" [probably 40—60 fathoms], on *Sertularia*, C. Holböll". In one Amphipod: 1 female, 1 male and 8 ovisacs; in another: 1 female and 1 male.

86. *Sphæronella Melphidippæ* n. sp.

(Pl. V, figs. 2 a—2 d).

Female unknown.

Male. — Allied to *S. capensis* H. J. H. The single specimen is 0.185 mm. long and somewhat longer than broad. Seen from below (fig. 2 a) the head is somewhat broader and considerably longer than the trunk, with the frontal margin naked. — The antennulæ are long, even more than one-third as long as the body, and besides somewhat robust, with long setæ. — Antennæ 3-jointed; the joints subequal in length, and the third terminates in a somewhat short, strong seta. — The mouth is unusually small. — Maxillulæ normal, with additional branch (exopod). — The maxillæ are very characteristic; the first joint is very robust and has on its postero-interior side a longitudinal row of about 5 very oblong, somewhat curved, acute processes (fig. 2 e); the second joint is broad at the base, the claw slender and somewhat long. — Maxillipeds moderately long; first joint robust, rather considerably longer than the remainder of the appendages, with some transverse rows of setæ on the anterior side, and among these rows one a little beyond the middle and one a little before the end are long, while the others, one of which near the base, are short, and besides the outer side of the joint has several setæ; the claw has a minute spine close before the end. — The submedian skeleton has two pairs of processes; the first pair, originating between the insertions of the maxillipeds, is of middle length, while the processes of second pair are quite small, oblong triangles near each other. — The ear-shaped arch surrounding the base of each antennula is equipped with hairs of middle length, and from that point the hair-covering continues in a narrow stripe of similar hairs along the whole length of the outside of the protruding lateral border of the head; from the posterior angle of this border a broad, transverse belt of similar hairs runs upwards and backwards across the side and the back of the animal in a very slanting direction (fig. 2 b). On the back behind this line we find the usual naked transverse area which is moderately long; the sides of the trunk, the posterior surface and the ventral surface excepting in front are rather densely covered with hairs of medium length. — The first pair of legs consists of a very broad and somewhat short, partly hairy basal part, from which projects a moderately long branch possessing a triangular protuberance of its base (fig. 2 d) and terminating in some hairs and a single seta about as long as the first joint of the maxillipeds. Second pair of legs (fig. 2 b) consists of a joint which is somewhat shorter and considerably thicker than the branch of first legs, has a rather large, dorsal, sub-triangular protuberance at the middle, and terminates in a seta, which is a little longer than that of first legs. — The caudal rami are thick, longer than thick, and the terminal seta about as long as that of first legs.

Ovisacs. — They are large, ovate, with numerous eggs.

Remarks. — Though the female is unknown I do not hesitate to establish this species, as the male, which is excellently preserved, is very characteristic by the armature of the basal joint of the maxillæ. And no other Choniostomatid has been found on any species of the genus *Melphidippa* Boeck.

Occurrence. — Taken by the "Ingolf" at a single place.

North-West of Iceland: Stat. 15: Lat. 66°18' N., Long. 25°59' W., 330 fathoms, temp. ÷ 0°75; in the marsupium of a mutilated *Melphidippa borealis* Boeck 1 male, 2 ovisacs, and a half-developed embryo of the Amphipod.

87. *Sphæronella Bonnier* H. J. H.

1897. *Sphæronella Bonnier* H. J. Hansen, Choniostomatidæ p. 136, Pl. VI, figs. 4 a—4 d; Pl. VII, figs. 1 a—1 b.

Occurrence. — It lives on females and generally in the marsupium of *Protomedeia fasciata* Kr. at West Greenland. Some few hosts determined by Krøyer were without special localities; others were gathered in the harbour of Godthaab (Lat. 64° 11' N.) in 2—3 fathoms by Th. Holm, and one among them was a female without marsupium bearing a small female and a male (Further particulars l. c. p. 137—38).

88. *Sphæronella Æginæ* n. sp.

(Pl. V, figs. 3 a—3 g).

Female. — The largest specimen is 2.1 mm. long and 1.95 mm. broad (fig. 3 a). The head is somewhat small and well defined from the trunk. The frontal margin is naked. — Antennulæ of middle length (fig. 3 d), rather robust, 3-jointed; first joint conspicuously shorter and thicker than the second, while the third is slightly shorter than the two others combined, and its distal setæ are moderately long. — Antennæ rather small, 3-jointed; second joint much longer than the first and slightly longer than the third, which is about as long as the terminal seta. — The mouth somewhat large; its border of medium breadth. — On the maxillulæ an additional branch could not be discovered. — The maxillæ normal; the basal joint smooth. — The maxillipeds scarcely of medium length; the first joint somewhat robust, naked; second and third joints completely fused and rather short, with a thick spine below the base of the claw, and the claw has 3 fine spines on the distal part of its concave margin.

The submedian skeleton does not show any peculiarity; at the base of each maxilliped several hairs directed inwards. The protruding lateral borders of the head naked. — The genital area (fig. 3 e) much narrower than the head (figs. 3 d and 3 e drawn with the same enlargement), forming a kind of transverse rectangle much broader than long, with the angles broadly rounded, the posterior margin rather concave and nearly incised at the middle, while the anterior has the median part concave and the lateral parts irregularly defined; pubescence completely wanting. The figure exhibits also a spermatophore on a long stalk, and the stalk of another. The caudal rami rather close together very near the posterior margin of the chitinized genital plate as two rounded knots; setæ absent and probably lost.

Male. — The specimen exhibited in figs. 1 f and 1 g is 0.42 mm. long and scarcely 0.32 mm. broad; seen from the side it is moderately thick. The head is conspicuously shorter than the trunk, and the animal is broadest just behind the head. The frontal border somewhat produced, rounded and naked. — The antennulæ only of moderate length and distinctly more slender than in female; first joint conspicuously longer and thicker than the second and scarcely as long as the third; setæ as in the female. — Antennæ small, 3-jointed. — Mouth somewhat small. — Maxillulæ with a distinct additional branch. — Maxillæ rather small; basal joint without tooth or setæ. — Maxillipeds somewhat small; first joint rather slender, with a few setæ on the anterior margin; second joint very slender; the third somewhat widened towards the end; the claw with about 3 fine spines on the concave margin towards the end. — The submedian skeleton with the second pair of processes somewhat long, cylindrical and diverging; the two other pairs wanting. — From

in front of the base of the antennulæ the lateral, protruding border of the head is equipped with a row of somewhat short hairs, but towards the posterior end of this border one finds a lateral patch of long hairs, and from its posterior end a stripe of long and dorsally extremely long hairs runs upwards on the side and across the back of the animal. While the whole ventral surface of the trunk, excepting the transverse area between the legs of first pairs, and besides the lateral surface is clothed with innumerable short hairs, the dorsal surface of the trunk is very different. Across the middle of this surface one sees a rather large, transverse, completely naked area (fig. 3 g); between this area and the stripe of extremely long hairs the skin is near the median line covered with moderately short hairs, and towards the sides the hairs are shorter; behind the naked area a transverse area with long hairs is found.

First pair of legs consists of a rather broad but short peduncle with two rami; the outer ramus is shorter than the breadth of the peduncle, 2-jointed, with first joint considerably thicker and shorter than the second which terminates in two setæ, the outer longer than the breadth of the peduncle and twice or more than twice as long as the other; the inner ramus is about half as long as the outer, one-jointed and terminates in a seta about as long as the shorter seta on the outer ramus. Second pair of legs small, two-jointed; first joint considerably thicker and much shorter than the second, which terminates in two setæ, both shorter than the setæ on the outer ramus of first legs. — Caudal rami placed considerably before the end of the body and rather close together; they are somewhat small, and each with a terminal seta conspicuously longer than the longest seta on first legs.

Ovisacs. — They are of medium size (fig. 3 c), with a moderately good number of eggs; the ovisac exhibited is a little oblong and 0.84 mm. long.

Remarks. — *S. Æginæ* is more similar to *S. Giardii* than to any other species hitherto known; the female does not show any striking feature, but the male differs especially by the peculiar clothing of the trunk, and besides the legs and the caudal rami afford valuable specific characters.

Occurrence. — Taken by the "Ingolf" at a single station.

Midway between Iceland and the Færoes: Stat. 3: Lat. 63°35' N., Long. 10°24' W., 272 fathoms, temp. 0°5; in the marsupium of *Ægina echinata* Boeck. On one host: 1 large female, 1 male and 4 ovisacs; on another: 1 female and 2 males.

Note. — It may be pointed out that *Sphær. Æginæ* is the first species of the family found on a representative of the sub-order Caprellidea. — Far east of the Færoes, at Lat. 62°40' N., Long. 1°56' E., 365 fath., temp. ÷ 0°3, the "Michael Sars" (Cand. mag. Ad. Jensen) captured 2 specimens of *Caprella punctata* Boeck infested with *Sphæronella* in the marsupium; on one host 1 female and 10 ovisacs very different in size, on the other *Caprella* 1 female and 3 small ovisacs. As no male was discovered I have not dissected a female for comparing it with *S. Æginæ*, fearing that without possessing the male it would be impossible to decide with certainty whether this parasite belongs to *S. Æginæ* or represents another new species.

B. Parasites on Cumacea.

89. *Sphæronella decorata* H. J. H.

1897. *Sphæronella decorata* H. J. Hansen, Choniostomatidæ, p. 150, Pl. VIII, figs. 3 a—3 o; Pl. IX, figs. 1 a—1 b.

Among the new material is found a pupa, a stage unknown of the present species. It is slightly more than 0.1 mm. long and similar to that of *S. insignis* H. J. H. described in the book quoted, differing only in being somewhat longer than broad, and possessing on the front end a somewhat short thread with a couple of thickenings; its whole surface is clothed with rather short hairs excepting on the protruding pouches representing antennulæ and all the mouth-parts.

Occurrence. — Taken by the "Ingolf" at a single station.

Davis Strait: Stat. 28: Lat. 65°14' N., Long. 55°42' W., 420 fathoms, temp. 3°5; 2 specimens of *Diastylis Rathkei* Kr. with parasites in the marsupium. On one specimen: 1 female and 1 male; on the other: 1 female and 1 pupa.

S. decorata was established on material found in the marsupia of six specimens of *Diastylis Rathkei* Kr. from West Greenland, without special locality. Further particulars on the contents of each marsupium of these hosts are given op. cit. p. 152—53.

Distribution. — Kara Sea, on *D. Rathkei* Kr. (H. J. Hansen).

90. *Sphæronella rotundata* n. sp.

(Pl. V, figs. 4 a—4 f).

Female. — An adult specimen (fig. 4 a) is 0.8 mm. and 0.94 mm. broad. The head is well defined from the trunk; its front margin (fig. c) is very broadly rounded, naked, and the area between that margin and the antennulæ and rostrum is simple. — Antennulæ (figs. 4 c—4 d) well developed, 3-jointed, with some setæ of moderate length; second joint a little shorter than the first or the third. — Antennæ wanting. — Mouth middle-sized. — Principal branches of the maxillulæ short; additional branch not discovered with certainty. — Basal joint of the maxillæ short, with some few, short filaments at the distal connecting membrane; second joint well marked from the claw. — Maxillipeds middle-sized; the proximal joint somewhat slender and without bristles; second and third joints coalesced, with a pubescent spine near the end; last joint pubescent towards the obtuse end.

The submedian skeleton moderately developed, and two pairs of ridges could be discerned. — The lateral margins of the head and the whole trunk naked. — Genital area (fig. 4 e) very much narrower than the head and much broader than long, with its median longitudinal part chitinized, and from this originates between the posterior part of the genital apertures a pair of chitinized plates, each of which runs somewhat backwards and then outwards and forwards as an arch, and serves for the fixation of the musculature opening the genital aperture; these apertures are rather near each other and proportionately long. — The caudal rami are extremely small and placed at the base of the median thin skin between the origin of the chitinized plates mentioned.

Male. — It is somewhat large (fig. 4 b) as compared with the female (fig. 4 a); the specimen drawn is 0.26 mm. long. Seen from below (fig. 4 f) its greatest breadth is situated off the base of the maxillæ; the head is longer than the trunk. In front of the antennulæ the head is much produced, and most of the margin is strongly curved, without incisions; its most frontal part is equipped with fine hairs. Somewhat behind this margin the lower surface shows a small, sub-quadratic, chitinized plate with four small holes; besides all four angles of the plate are rounded and the margins incurved. — Antennulæ about as in the female, excepting that the second joint is much shorter than any of the two others. — Antennæ wanting. — The hairs on the border of the mouth of middle length. — Maxillulæ as in the female. — Maxillæ rather small; basal joint smooth, but many bristles are seen along the distal connecting membrane. — Maxillipeds have the first joint rather long and moderately robust, its distal half is equipped with numerous hairs on the anterior side, and on the lower surface similar hairs are arranged in some four transverse rows; second and third joints fused, with the distal spine somewhat short and robust; terminal joint a little pubescent, acute.

The submedian skeleton is moderately developed, but has at the base of the maxillipeds two pairs of well developed processes, the anterior outer pair about half as long as the posterior, rather long pair. — The lateral border of the head to somewhat in front of the antennulæ with numerous rather long hairs. The entire trunk — excepting the most anterior part of the ventral surface — is clothed with rather long hairs, but at the limit between head and trunk a belt of extremely long hairs runs from the end of the protruding border of the head upwards on the side and across the dorsal surface. — The legs are well developed and both pairs nearly similar; each leg consists of a short and moderately thick, hairy sympod with two rami longer than the sympod, and each terminates in a very long and strong spine slightly marked off from the ramus; the outer ramus with its spine is a little longer than the inner one. — Each caudal ramus is a small joint, about as long as broad, and terminating in a moderately long, thin spine.

Ovisacs. — Only 2 ovisacs were found; they are very small, each with 9 eggs.

Remarks. — This species is easily separated from the 5 other forms of *Sphæronella* living in the marsupium of Cumacea and described by me in 1897. The male of *S. rotundata* differs strongly by the simple shape of the front margin and the long thoracic legs; the female is as usual less characteristic, but differs in some easily observed particulars, as the frontal margin, the antennulæ, etc.

Occurrence. — This parasite was discovered in the marsupium of *Hemilamprops cristata* G. O. S.; the hosts have not been taken by the "Ingolf" but by the "Thor" at the following place.

South-West of the Færoes: Lat. 61°08' N., Long. 9°28' W., 710—820 met., temp. 8°20'; 3 females, 2 males and 2 small ovisacs in the marsupia of adult females.

C. Parasites on Isopoda.

91. *Sphæronella curtipes* H. J. H.

1897. *Sphæronella curtipes* H. J. Hansen, Choniostomatidæ p. 164, Pl. X, figs. 2 a—2 g.

The male found on *Janira Vilhelminæ* Steph. captured in 1911 is 0.92 mm. long and agrees with my earlier drawings and description of *S. curtipes* excepting one, viz. that the lamellar protuberance between the broad frontal border and each antennula seems to be naked, while it has short marginal hairs in the

type, but this point is certainly too small to be considered a character justifying the establishment of a new species. — The female from the Isopod named is 3 mm. long, but 3.2 mm. broad, thus considerably larger than the type (2.4 mm. long, 2.2 mm. broad), but the difference may nearly be explained by the fact that the female from *J. Vilhelminæ* has laid only 8 ovisacs, while 12 ovisacs were found at the type. Though it is impossible to examine more closely the head and the genital area of the female without dissection, this is deemed unnecessary because the male sex, which generally affords more conspicuous specific characters than the female, agrees so well with the type.

Occurrence. — Not taken by the "Ingolf", but by two other Danish expeditions to West Greenland. West Greenland, at Lat. 67°45' N., Northern Strömfjord, 213—218 fathoms, temp. \div 0°7; 1 female, 1 male and 8 ovisacs in the marsupium of a specimen of *Janira Vilhelminæ* Steph. secured by Dr. V. Nordmann.

Davis Strait: Lat. 66°32' N., Long. 55°34' W., 100 fathoms; 1 female, 2 males and 12 ovisacs in the marsupium of a specimen of *Janira spinosa* Harger, captured during the cruize of the "Fylla" 9/VII 1884 by Th. Holm.

92. *Sphæronella Munnopsidis* H. J. H.

1897. *Sphæronella Munnopsidis* H. J. Hansen, Choniostomatidæ p. 168, Pl. X, figs. 4 a—4 d.

The quality of my new material makes it impossible to add anything worth writing to my earlier description. The hitherto unknown male is probably only to be found together with a somewhat young female which has deposited at most only a portion of its eggs.

Occurrence. — Not taken by the "Ingolf", but by the IIInd Amdrup-Expedition in 1900 at two places (by Mag. sc. Sören Jensen).

East Greenland: Turner Sound, Lat. 69°44' N., about 3 fathoms; 1 *Munnopsis typica* M. Sars with the marsupium extremely swollen and containing 1 damaged female and 14 ovisacs.

— — Hurry Inlet, Lat. 70°50' N., 7—0 fathoms; 1 *Munnopsis typica* with a half empty and irregularly collapsed female parasite and 18 ovisacs in the marsupium.

Distribution. — Kara Sea, on *Munnopsis typica* M. Sars (H. J. Hansen).

93. *Sphæronella Munnæ* n. sp.

(Pl. V, figs. 5 a—5 d).

Female. — The single specimen had probably not yet laid any of its eggs and is only 0.66 mm. long and 0.55 mm. broad (fig. 5 a). The head is large in proportion to the trunk and not marked off; its frontal border not produced, transverse and nearly straight. — Antennulæ (fig. 5 b) 2-jointed; first joint considerably thicker and much shorter than the second, which has some moderately short setæ. — Antennæ wanting. — Mouth of very moderate size. — Maxillulæ normal; the additional branch (exopod) distinct. — Maxillæ somewhat weak; on the proximal joint no bristles could be discovered at its end; second joint fused with the claw which is obtuse and with some tiny bristles on the rounded end. — Maxillipeds somewhat long;

first joint more than half as long again as the remainder of the maxilliped and rather curved, naked; second and third joints completely fused, forming a single somewhat robust and curved joint; the claw rather short, slender, acute; below its insertion the usual spine, which is thick, short, very obtuse, with tiny bristles around the end.

The submedian skeleton moderately developed. — Lateral borders of the head scarcely developed, naked; somewhat behind the base of the maxillipeds the ventral side of the trunk has a number of setæ mostly arranged in transverse rows, but no other setæ could be discovered on the trunk. — Genital area (fig. 5 c) is a kind of transverse, chitinized ring much broader than long and with both the anterior and the posterior margin a little concave; besides the anterior and the posterior parts of the ring are united by a median longitudinal chitinized plate somewhat narrow near its middle; setæ are wanting, but the caudal rami, which originate very near each other between the middle of the genital apertures on the ring, are very small, oblong and each with two small terminal bristles.

Male. — A well-preserved specimen (fig. 5 d) is 0.275 mm. long and almost half as long again as broad; seen from below its greatest breadth is found at the base of the head which is about as long as the trunk. In front of the antennulæ the head is moderately produced, the margin broadly convex and even a little incurved at the middle, naked. — Antennulæ somewhat robust and of middle length, 2-jointed; first joint much longer than the second; the usual setæ of very moderate length. — Antennæ wanting. — Mouth rather small. — Maxillulæ with additional branch, as in the female. — Maxillæ middle-sized; first joint seems to be smooth; the claw acute. — Maxillipeds of medium length; first joint somewhat robust, beyond the middle with a transverse row of hairs on the lower and the anterior side; second and third joints coalesced, but the joint formed in this way is narrowed beyond the middle; the terminal joint, the claw, is acute with some very short setæ or tiny spines along the concave margin; the spine below the insertion of the claw is oblong-triangular, acute.

The submedian skeleton is moderately developed and without free posterior processes. — The lateral borders of the head from the antennulæ backwards are equipped with hairs of middle length; the entire trunk, excepting the most anterior part of its ventral surface, is covered with long hairs. — Trunk-legs and caudal rami wanting.

Ovisacs unknown.

Remarks. — The male is more similar to those of *S. dispar* and *S. insignis*, which live on Cumacea, than to the same sex of *S. curtipes* on species of *Janira*; it is easily distinguished from every other species hitherto known.

Occurrence. — Taken by the "Ingolf" at a station in the cold area.

East of Iceland: Stat. 105: Lat. 65°34' N., Long. 7°31' W., 762 fathoms, temp. ÷ 0°8; in the marsupium of a specimen of *Munna spinijera* H. J. H. 1 female and 2 males.

94. *Sphæronella Nannonisci* n. sp.

(Pl. V, figs. 6 a—6 b).

Female. — The single specimen, which had deposited all its eggs, is nearly empty and quite small, being 0.44 mm. long and only a little more than half as broad as long (fig. 6 a), consequently very oblong-

ovate; the head is uncommonly large in proportion to the trunk and not marked off. Frontal margin naked, transverse and nearly touching the base of the proboscis. — Antennulæ rather short with a few short setæ, 3-jointed; first joint distinctly longer and thicker than any of the two others, which are subsimilar in length. — Antennæ wanting. — The rostrum, excepting its terminal part, is much inflated (fig. 6 b) with the front wall reaching for beyond the anterior margin of the head; the mouth is middle-sized. — Maxillulæ somewhat small; the additional branch is well developed. — Maxillæ somewhat small; first joint naked; second joint completely fused with the curved, acute claw. — Maxillipeds somewhat clumsy; first joint naked; second and third joints marked off from each other, and the latter with a minute, simple spine below the insertion of the acute, simple claw.

Submedian skeleton rather feebly developed, without processes. Both the lateral borders of the head and the entire trunk without hairs. — Genital area small, transverse and together with the caudal rami in all features so similar to that in *S. Munnæ* that a description is superfluous.

Male unknown.

Ovisacs. — Together with the female described was found a lump consisting of two ovisacs pasted together; the ovisacs are somewhat irregularly shaped, each about twice as large as the emptied female and with a rather good number of eggs.

Occurrence. — Taken by the "Ingolf" at a station in the warm area.

West of Iceland: Stat. 90: Lat. $64^{\circ}45'$ N., Long. $29^{\circ}06'$ W., 568 fathoms, temp. $4^{\circ}4'$; in the marsupium of a specimen of *Nannoniscus simplex* H. J. H. 1 female and 2 ovisacs.

95. *Sphæronella Pleurogonii* n. sp.

(Pl. V, figs. 7 a—7 h).

Female. — A very large specimen (fig. 7 a) is 0.97 mm. long and 0.95 mm. broad; it had not deposited the eggs. The head is rather small as compared with the trunk and well marked off. The frontal margin is moderately convex, naked. — The antennulæ (fig. 7 d) very short, 2-jointed; first joint considerably thicker than long and twice as thick as the second, which is a little oblong with only 2 setæ. — Antennæ wanting. — Rostrum well developed; mouth middle-sized. — Maxillulæ with the two principal branches rather long and besides an additional branch. — Maxillæ only moderately developed; basal joint somewhat small and smooth; second joint fused with the claw, which has some minute bristles towards the obtuse end. — Maxillipeds proportionately somewhat small; first joint twice as long as the other joints together, curved, without hairs; second and third joints are fused into a moderately thick but very short joint, while the last joint is still shorter, cylindrical with the end rounded, and equipped with a number of minute bristles.

Submedian skeleton distinct though feebly developed. Posterior half of the protruding lateral borders of the head with a row of very short hairs, while the trunk seems to be quite naked. — Genital area (fig. 7 e) only about half as broad as the head, showing a chitinized ring much broader than long; its front margin is slightly concave at the middle, a longitudinal median plate runs from the anterior to the posterior part of the ring, and the posterior margin is triangularly incurved at the middle, while the caudal rami are inserted

close together on the softer skin just behind the ring; each ramus is minute, a little oblong, with two rather short terminal setæ.

Male. — This sex is unusually small; the specimen represented in fig. 7 b — drawn by the same enlargement as the female shown in fig. 7 a — is only 0.135 mm. long; fig. 7 f exhibits the same male highly magnified, showing it to be nearly regularly oval, only a little more than one-fourth as long again as broad. It is broadest off the base of the maxillipeds, and the head is somewhat longer than the trunk. The frontal margin is moderately produced, moderately and regularly convex, without hairs. — Antennulæ very short, somewhat indistinctly 2-jointed, the first joint somewhat robust and longer than thick, the second small; each antennula has some few normal and somewhat short setæ and a longer sensory seta. — Antennæ wanting. — Mouth middle-sized. — Maxillulæ small; an additional branch could not be discerned with any certainty. — Maxillæ middle-sized; first joint smooth; the claw curved and acute. — Maxillipeds similar to those in the female, having the distal joints reduced in size and the end obtuse; bristles could not be perceived on any joint.

The submedian skeleton is somewhat feebly developed, without posterior processes. The protruding lateral borders of the head equipped with moderately short hairs. The whole trunk — excepting as usual the anterior part of the ventral surface — is covered with proportionately long hairs. Trunk-legs and caudal rami wanting.

Ovisacs. — It seems to be a rule that the female of this species deposits only two ovisacs, and these occupy the lateral parts of the marsupial cavity, having the female between them. Each ovisac is consequently very large and very oblong (fig. 7 c); the ovisac figured is as long, and half as broad, as a very large female, 0.97 mm. long and a little less than half as broad; the ova are rather large and consequently moderately numerous.

Larvæ. — A completely developed specimen (fig. 7 g) taken free in a marsupium is 0.3 mm. long, thus somewhat more than twice as long as the male. The cephalothorax is ovate, about one-third as long again as broad. On the front, inside the base of the antennulæ, a couple of very oblique lists, running from the proboscis forwards and outwards to about the anterior angle of the insertion of the antennulæ. — Antennulæ 2-jointed, first joint distinctly longer than second; sensory seta a little less than half as long as the animal. — Antennæ as long as the antennulæ, 3-jointed; second joint about as long as first and third combined; third only a little longer than broad and terminating in two setæ, one of which quite short, the other about as long as second joint. — Maxillulæ rather small; an additional branch could not be traced. — Maxillæ middle-sized; first joint shows a distal row of 4 very small, subcylindrical processes, and most probably another similar row is covered by second joint in the position drawn; claw without teeth. — Maxillipeds middle-sized; second joint somewhat longer than broad and half as long as the third; terminal spine much longer than second and third joint together. — Abdomen middle-sized, moderately robust; first segment conspicuously longer than second, and the spines from its postero-lateral angles reach far beyond the end of the caudal rami.

Postlarval Development. — A single pupa (fig. 7 h) was found; it is 0.143 mm. long, somewhat longer than broad, ovate, with a short thread near the front end. Antennulæ, proboscis, maxillulæ, maxillæ

and maxillipeds are seen as protruding naked pouches of somewhat irregular shape. The whole pupa is clothed with hairs which are conspicuously longer posteriorly than anteriorly, only the pouches mentioned and the intervals between them are naked.

Remarks. — Both in male and female the antennulæ and the distal joints of the maxillipeds are more reduced in size and degree of development than is generally the case in the rich genus *Sphaeronella*. The pupa and the larva show more affinity to forms parasitic on Cumacea than to those on Amphipoda.

Occurrence. — The parasite, which has not been secured by the "Ingolf", inhabits the marsupium of *Pleurogonium spinosissimum* G. O. S., and has been gathered at Iceland at the following places.

North-West Iceland: Önundarfjord, 11—12 fathoms, 18/V 1893, Mag. sc. W. Lundbeck; 1 larva.

East Iceland: Mjoifjord, 40 fathoms, 19/V 1899, Mag. sc. R. Hörring; on one host 1 female (nearly empty) and 2 long ovisacs (male not looked for).

— — Faskrudsfjord, 20—50 fathoms, clay, 17/VII 1899, Mag. sc. R. Hörring; 2 infested females, one with 1 female, 1 larva and 1 pupa; the other with 1 female and 1 male.

— — Breiddalsvik, 6 fathoms, mud and black sand, 18/VII 1900, Dr. A. C. Johansen; 7 females infested: one with 1 large female and 1 male, the second with 1 very large female (the type figured) and 1 larva; the third with 2 very long ovisacs and 1 quite small, almost empty and shrivelled female (0.62 mm. long, 0.21 mm. broad), the fourth specimen infested as the third; the fifth has the marsupium filled with nearly developed larvæ. In the two other specimens the marsupium has not been opened.

Choniostoma H. J. H.

This genus comprises hitherto only 2 species, both from the arctic and boreal regions, and both found in the "Ingolf" area. — It may be noted here that in spite of special search I have not yet been able to discover any male of the genus.

96. *Choniostoma mirabile* H. J. H.

1886. *Choniostoma mirabile* H. J. Hansen, *Dijmphna-Togtets zool.-bot. Udbytte*, p. 271, Tab. XXIV, figs. 7—7 h.

1897. — — H. J. Hansen, *Choniostomatidæ*, p. 171, Pl. X, figs. 5 a—5 c; Pl. XI, figs. 1 a—1 k.

Occurrence. — Not taken by the "Ingolf", but by two other expeditions.

East Greenland: Angmagsalik (Lat. 65°30' N.), 3—0 fathoms, 2nd Amdrup-Exped. 14/LX 1900; on the left side of the carapace of *Spirontocaris Gaimardii* H. M.-Edw. in a large swelling 1 female and 12 ovisacs.

South-West of Iceland: Lat. 63°46' N., Long. 22°56' W., 150 met., temp. 7°28, the "Thor" 2/VII 1904; 1 specimen of *Spirontocaris Lilljeborgii* Danielssen with 1 female

and 3 ovisacs in a large swelling on the left side of the carapace, and a large *Sylon Hippolytes* Kr. on the abdomen.

In the work quoted it is mentioned (p. 174) that ovisacs of a species of *Choniostoma* were found on *S. Gaimardii* from the Davis Strait at Lat. 66°30' N., Long. 54°50' W., 40 fath., but as no female was present it was impossible to determine the parasite.

Distribution. — Kara Sea, the branchial cavity of *S. Gaimardii* (H. J. Hansen). — In my monograph it was stated (p. 174) that specimens of *Choniostoma* had been secured by Max Weber on *S. Gaimardii* from the Murman Sea, and by Sparre Schneider on the same shrimp from Hillesø in the Malangen Fjord (Finmarken), but that in both cases the parasite could not be referred to species.

97. *Choniostoma Hansenii* Giard & Bonn.

1889. *Choniostoma Hansenii* Giard & Bonnier, Bull. scient. de la France et de la Belgique T. XX, p. 366
[without description].
1895. — — Giard & Bonnier, Bull. sci. France et de la Belg. T. XXV, p. 479.
1897. — — H. J. Hansen, Choniostomatidæ p. 174, Pl. X, figs. 6 a—6 b; Pl. XI, figs.
2 a—2 f.

Among the 4 immature females taken together (see below) the largest specimen has arrived at the shape of the adult; it is 1.67 mm. broad and 1.5 mm. long; the 3 other specimens are nearly circular in outline, and the diameter of the smallest specimen is 1.05 mm. All 4 specimens are somewhat depressed. The largest specimen has a number of proportionately long setæ on the sides and some on the dorsal surface, while the ventral surface is naked excepting towards the margins and besides the median part of the front margin. The small females look more setiferous than the largest specimen, but the distribution of their long setæ on the body is about the same.

Occurrence. — Not taken by the "Ingolf".

West Greenland: Lille Karajak Fjord (ab. Lat. 70°20' N.); specimens taken by Dr. E. Vanhöffen on *Spirontocaris Gaimardii* M. Edw. and *S. polaris* Sab.

North Iceland: "Reykjarfjördr", 3—0 fathoms, "Diana" (A. Ditlevsen) 21/VII 1902; 1 female and 9 ovisacs in a large swelling on the right side of the carapace of *Spirontocaris Gaimardii*; the shrimp has besides on the abdomen a moderately young female with male of *Phryxus abdominalis* Kr.

North-East Iceland: Midfjord, 40½—50 fathoms, "Diana" (Mag. sc. R. Hörring) 14/V 1898; 2 infested specimens of *S. Gaimardii*. One of these specimens is an ovigerous female; its carapace is scarcely swelled on the left side, nevertheless the branchial cavity contained 4 immature females rather different in size (see above), but no ovisacs or male; the right side of the same shrimp is distinctly swelled and the branchial cavity contained 2 females very different in size — the large one scarcely full-grown — and besides a larva in second stage of an Epicarid, probably *Bopyroides Hippolytes* Kr.

The other host is somewhat larger, without ova; in a considerable swelling on the left side of the carapace is found 1 adult female and 5 ovisacs. — Besides the tube with the two shrimps contained a male *Phryxus abdominalis* Kr. which probably had been affixed on the specimen without ova.

Distribution. — Kara Sea, in the branchial cavity of *Spirontocaris Gaimardii* and *S. polaris* (H. J. Hansen). As stated above (p. 78) it may be possible that the specimens of *Choniostoma* from the Murman Sea and Finmarken belonged to this species.

Family Herpyllobiidae.

This family was established by the present writer in 1892 in a small paper which is quoted below at *Herpyllobius arcticus*; it contains the description of a most curious parasitic Copepod *Rhizorrhina Ampeliscæ* H. J. H. (the generic name ought to be written *Rhizorrhina*) and additions to our knowledge of the male of *Herpyllobius arcticus*. To the new family I referred *Herpyllobius* Stp. & Ltk. (*Silenium* Kr.), *Eurysilenium* M. Sars and *Rhizorrhina* H. J. H., "with considerable probability" *Saccopsis* Levinsen and *Bradophila* Levinsen, not improbably *Trophoniphila Bradyi* M'Intosh (1885) and possibly *Oestrella Levinseni* M'Intosh (1885). All forms, excepting *Rhizorrhina*, are parasites on Annelids.

Only two of the genera, viz. *Herpyllobius* and *Rhizorrhina*, may be said to be rather well known. The female consists in these genera (and in *Eurysilenium*) of two portions joined by a short stalk; the portion found outside the host is a more or less subglobular, limbless body containing the reproductive organs and bearing two ovisacs; the stalk is either a short tube or two very thin tubes lying close together; the portion within the host consists either of ramified tubes (*Rhizorrhina*) or of a large, very oblong, flattened (*Herpyllobius*) or round (*Eurysilenium*), soft body without vestige of any external organ. In all cases the animal is partly endoparasite, as the portion within the host is free, not surrounded by any chitinous membrane belonging to the host. The larval males fasten themselves in the first *Cyclops*-stage (*Rhizorrhina*) or in the second *Cyclops*-stage to the skin of the female more or less near its genital apertures by a viscous substance from the larval mouth. Later on the male is seen within the larval cephalothorax as a limbless body without mouth or any other organ; in *Herpyllobius* (not in *Rhizorrhina*) the male develops anteriorly a small, conical part which breaks through the front of the larval skin and fastens its end by a viscous substance on the female. In older males most of the body is occupied by two enormous spermatophores, which in *Rhizorrhina* send their ducts through a ring in front of the larval mouth, while in *Herpyllobius* the ducts project through the above-mentioned rupture in the larval skin in front of the larval mouth and behind the secondary frontal fixation of the male itself.

These statements may be sufficient here for the general characterization of this extremely curious family. Most of the literature on the family is in Danish, and the major part has unfortunately a controversial character; the most exhaustive treatment (80 pages) is found in my book published in 1900 and quoted at *Herpyllobius arcticus*.

Only two of the genera enumerated above are found in the "Ingolf" area.

Herpyllobius Stp. & Ltk. (*Silenium* Kr.).

All specimens from our area are referred to a single species, *H. arcticus*. Whether the two other northern species, *H. crassirostris* M. Sars and *H. affinis* H. J. H., are valid may be doubtful, but these questions cannot be finally settled without a most detailed examination of the appendages and their setæ of the larval males.

98. *Herpyllobius arcticus* Stp. & Ltk.

1861. *Herpyllobius arcticus* Steenstrup & Lütken, K. Danske Vid. Selsk. Skr. 5. Række, naturh. og math. Afd. 5. B. p. 426, Tab. XV, fig. 40 α , 40 γ , 40 δ (not 40 β).
1863. *Silenium Polynoës* Krøyer, Nat. Tidssk. 3. Række, Bd. II, p. 403, Tab. XVIII, fig. 6, a—g.
1877. *Herpyllobius arcticus* Levinsen, Vid. Medd. Naturh. Foren. i Kjøbenhavn, 1877, p. 363, Tab. VI, Fig. 12—18.
1892. — — H. J. Hansen, Entom. Medd. udgivne af Entom. Foren. i Kjøbenhavn, 3. B., p. 227—231.
1900. — — Søren Jensen, Overs. Kgl. Danske Vid. Selsk. Forhandl. 1900, p. 84, Tab. I, Fig. 8—9, Tab. II, Fig. 10—18.
1900. — — H. J. Hansen, Danmarks Stilling og Tilstand, II. Det Kgl. Danske Vid. Selskab; med Tillæg, p. 124—205.
1912. — — Kathleen Haddon, Quart. Journ. Microsc. Sci., Vol. 58, pt. 2, p. 385—410, Pl. 22 and 4 Text-figures.

In this synonymical list the more important publications as to *Herpyllobius arcticus* (and the family Herpyllobiidae) are enumerated. The animal was first mentioned, without name, by Krøyer (1838); other papers dealing with this vexed topic or stating new localities have been written by Steenstrup (1869), M. Sars (1870), Krøyer (1870), Schiödte (1870), M'Intosh (1874), Claus (1875), H. J. Hansen (1886(1887) and 1897), Giard & Bonnier (1893), Gravier (1912), K. Stephensen (1912, 1913 and 1916). The papers from 1838 to 1912 written by all these authors may be found noted either in Kathleen Haddon's above-named treatise or in K. Stephensen's "Conspectus", 1913.

The material from the "Ingolf" area seen by me is very large, comprising specimens from nearly thirty localities. All the hosts preserved belong to the genus *Harmothoë*; most of them to *H. imbricata* L., but some among them to *H. rarispina* Sars; besides parasites have been found on 2 specimens of *H. mollis* Sars, and on a single specimen of *H. aspera* Arm.-Hansen¹. Some authors state that it has also been found on a few other Annelids (see "Occurrence" and "Distribution").

The majority of the specimens of this parasite are found on the upper surface of the head of small specimens of the host, but sometimes also on good-sized or large hosts; in a few cases 2 parasites are found near each other on the same head. Sometimes a single parasite or even 2 parasites may be observed on the body in front of or behind its middle, but at or just above the parapodia. Generally the parasites have their external body subglobose and the ovisacs most frequently not much longer than broad, but sometimes the

¹ The major part of the hosts has been determined by Mag. sc. H. Ditlevsen.

external body is larger and somewhat oblong, and especially — but not exclusively — in such cases the ovi-sacs are somewhat or considerably longer in proportion to breadth than usual. Large parasites are most frequently found on large hosts.

Occurrence. — Taken by the "Ingolf" at two stations.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fathoms, temp. 3°9; 1 female on the head of *Harmothoë aspera* Arm. Hansen.

— — Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fathoms, temp. 3°6; 1 female on the head of *Harmothoë sp.*

H. arcticus has been gathered at numerous places along the western coast of Greenland. The most northern locality is at about Lat. 76°8' N., Long. 68°30' W., 5—12 fath. (Sofia Exped., Sv. Riksmuseum). The other places are: Upernivik, Lat. 72°47' N. (Capt. Ryder); Prøven, Lat. 72°23' N., 6—10 fath. ("Fylla" 1886, Th. Holm); Disco Bay (Traustedt); Ritenbenk, Lat. 69°44' N., 20—45 fath. (Sofia Exped., Sv. Riksmuseum), and from the same colony 2 old specimens determined by Steenstrup & Lütken; Godhavn, Lat. 69°14' N. (specimens in Sv. Riksmuseum secured by Amondsen, and in the Copenhagen Museum gathered by Traustedt); Claushavn, Lat. 69°05' N., 15—20 fath. and 20 fath. (Öberg, Sv. Riksmuseum); Egedesminde, Lat. 68°42' N., 5—10 fath. and 30—40 fath. (Öberg, Sv. Riksmuseum), and at the same locality specimens have been gathered by Traustedt and especially by Levinsen; Northern Strömfjord, ab. Lat. 67°40' N. 41—21 m., temp. \div 0.5°—+ 0.5°, and 200—240 m. (Dr. V. Nordmann leg., K. Stephensen 1913); Holstensborg, Lat. 66°56' N., 10 fath. (Prof. D. Bergendal); Ikertokfjord, Lat. 66°40' N. ("Fylla", Th. Holm); Sukkertoppen, Lat. 65°25' N., 60—70 fath. and 200 fath. (respectively Öberg and Amondsen, Sv. Riksmuseum), besides in 5—20 fath. ("Fylla", Th. Holm); Godthaab, Lat. 64°11' N. (Amondsen, Sv. Riksmuseum); Lat. 63°47' N., Long. 52°56' W. (J. Lindahl, Sv. Riksmuseum); Julianehaab, Lat. 60°43' N., 10—25 fath. (Sofia Exped., Sv. Riksmuseum); Bredefjord, ab. Lat. 60½°—61° N., at 3 stations (see Stephensen, 1916). — At East Greenland the parasite has been secured at Tasiusak, Lat. 65°37' N. (II. Amstrup Exped.); besides in Danmarks Havn, Lat. 76°45' N., 5—8 fath., and at Hvalrosodde, Lat. 76°55' N., 0—5 fath. (Danmark Exped., K. Stephensen 1912). — Levinsen mentions it from *Eunoë Oerstedii* Mgrn.; locality unknown.

At Iceland *H. arcticus* is less common. It has been gathered at North-West Iceland in Dyrefjord (Mag. sc. W. Lundbeck), and at East Iceland in Berufjord (Torell, Sv. Riksmuseum). — Finally secured south-west of the Færoes at Lat. 61°15' N., 9°35' W., ab. 460 fath., on *Harmothoë mollis* Sars (the "Thor", Dr. Joh. Schmidt).

Distribution. — A gigantic specimen of *Harmothoë nodosa* Sars with 2 parasites on the head from Lat. 72°8' N., Long. 74°20' W., 10—23 fath. (E. Nilsson, Sv. Riksmuseum); Gulf of St. Lawrence, on *Nychia Amondseni* (according to Mc'Intosh, 1874); Kara Sea, 49—51 fath., on *Harmothoë imbricata* L. (H. J. Hansen, 1886); Gulf of Georgia, Puget Sound, on *Harmothoë* (Kathleen Haddon, 1912). Finally Gravier (1912) states that *H. arcticus* is found on three species of Polynoids from the Antarctic, but as I do not believe in bipolarity of any species I suppose that Gravier's specimens must belong to an allied species.

Saccopsis Lev.

Only a single species is known.

99. *Saccopsis Terebellidis* Lev.

1877. *Saccopsis Terebellidis* Levinsen, Vid. Medd. Naturh. Forening i Kjøbenhavn, 1877, p. 374, Tab. VI, Fig. 21—22.

Besides a specimen has been figured (Tab. XV, fig. 40 β) in Steenstrup & Lütken's work and referred by them with doubt to *Herpyllobius arcticus*.

Levinsen established this form on 2 specimens, one of which is preserved; it is impossible to see more on the type than that described by him in 1877. A specimen from Tasiusak is larger, with the anterior part of the body more slender and produced; the frontal bulla shows a distinct central hole. In contradistinction to *Herpyllobius* Levinsen could not discover any part of the parasite hidden within the host and projecting from the margin of the bulla; I have inspected the above-named specimen from Tasiusak, removing a portion of the bulla from the tissue of the parapodium, but could not discover any internal part of the parasite; besides the inspection in a similar way of one of the specimens collected by Bergendal gave the same negative result. It is, however, scarcely possible to decide the question with absolute certainty before a good material well preserved for cutting sections has been procured. — No male could be discovered on any females.

Occurrence. — Not taken by the "Ingolf".

It has been taken at the following 3 places in northern West Greenland and always on *Terebellides Stroemii*: Umanak Lat. 70°40' N., 1 specimen referred with doubt by Stp. & Ltk. to *Herpyllobius* (Moberg leg.); Fortune Bay, Lat. 69°15' N. on Disko, 20 fath., 1 specimen (Öberg, Sv. Riksmuseum); Jakobshavn, Lat. 69°13' N., 4 specimens (Bergendal leg., Levinsen det.); Egedesminde, Lat. 68°42' N., 2 specimens, (described by Levinsen). — Furthermore taken at Tasiusak, East Greenland at Lat. 65°37' N., 6—10 fath., on a setiferous parapodium far in front on a specimen of *Terebellides Stroemii* (II. Amdrup Exped.).

K. Stephensen (in "Meddelelser om Grønland. LIII", 1916, p. 305) mentions 3 specimens on *Leucariste arcticus* M. Sars from Bredefjord, southern West Greenland; he refers them with a query to *Saccopsis Terebellidis*, and it is far from improbable that they belong to another species.

Genera of unknown position.

Crypsidomus Lev.

This genus, established on a single species, is completely endoparasitic, as only the ovisacs are found outside the body of the host. Possibly it is somewhat related to *Xenocoeloma Brumpti* Caullery & Mesnil, an extremely curious hermaphroditic Copepod, which has been the subject of an elaborate and admirable study by the two French Zoologists (Bull. Biol. de la France et de la Belgique, T. LIII, 1919, p. 161—233, Pls. I—IV et 20 fig. dans le texte)¹.

¹ A digression may perhaps be inserted here. In reading the French paper the idea strikes me that it would be extremely desirable if some able Zoologist, who possesses much experience in modern technicalities, could spend some months at Egedesminde in order to collect and partly to study on the spot a rich material of *Crypsidomus*, *Herpyllobius* and *Saccopsis* — it would be difficult to point out any other group of marine animals promising so remarkable results as I venture to predict the anatomy and development of these Copepods can yield.

100. **Crypsidomus Terebellæ** Lev.

1877. *Crypsidomus Terebellæ* Levinsen, Vid. Medd. Naturh. Forening i Kjøbenhavn, 1877, p. 25, Tab. VI, Fig. 19—20.

Occurrence. — Not taken by the "Ingolf".

It is evidently not rare at West Greenland. It has been found on *Thelepus circinnatus* at Upernivik, Lat. $72^{\circ}47'$ N., 1 specimen (Oirik); on *Nicolea arctica* at Prøven, Lat. $72^{\circ}23'$ N. (Torell, Sv. Riksmuseum); at Ritenbenk, 40—50 fath. (Öberg, Sv. Riksmuseum); on *Terebella cirratu* at Egedesminde, many specimens (Levinsen), and 1 specimen from about 30 fathoms at the same locality (Bergendal); at Holstensborg on *Thelepus circinnatus*, 1 specimen (Bergendal), at Sukkertoppen on *Thelepus circinnatus*, 1 specimen (Holbøll); finally on *Nicolea zostericola* in Bredefjord, at Lat. $60\frac{3}{4}^{\circ}$ N. 40—70 m. (Stephensen leg. & det. 1916).

Distribution. — Eastport, Maine, 1 specimen presented by Packard (Copenhagen Mus.). Kara Sea, 53 fath.; 1 specimen on *Artacama proboscidea* (H. J. Hansen, 1886).

Psilomallus Kr.

This enigmatic genus was established on a single specimen.

101. **Psilomallus Hippolytes** Kr.

1863. *Psilomallus Hippolytes* Krøyer, Nat. Tidsskr. 3. Række, B. II, p. 410, Tab. XVII, fig. 10.

Krøyer found a single specimen on the inner surface of the carapace of *Spirontocaris groenlandica* J. C. Fabr. (*Hippolyte aculeata* O. Fabr., Krøyer) from West Greenland; the specimen seems to be lost. Judging from Krøyer's figure and description I am completely unable to entertain any opinion on the relationship of the animal; I am apt to guess that it represents a stage in the development of some perhaps unknown parasitic Copepod.

Additional Remarks.

In second line on p. 4 it is said on the Harpacticoida: "No form of this gigantic division is known to be parasitic". As to the Harpacticoida from the "Ingolf" that statement is true, but as to forms outside our area it can not be maintained. In 1879 Chr. Aurivillius established *Balenophilus unisetis* Aur., found by him in great quantities on the baleen of *Balenoptera Sibbaldii* at Vadsö. East Finmark; this Copepod, which according to Aurivillius and Sars certainly is a commensal, may perhaps also live within the "Ingolf" area. — Furthermore G. P. Farran described (in 1914) a Harpacticid Copepod, *Cholidya polyphi*, living in considerable number as a parasite on the inside of the arm-membranes of a deep-water octopus, *Polyopus ergasticus*, captured off the S. W. coast of Ireland. It may perhaps be possible to discover some allied parasite on Cephalopoda in the "Ingolf" area.

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. *Cyclopina Phallusia* n. sp.

- Fig. 1 a. Female from Vestmanhavn, from above; $\times 21$.
 — 1 b. Left antennula of the female from Lat. $61^{\circ}49'$ N., from below; $\times 56$.
 — 1 c. Left antenna of the last-named specimen, from below; $\times 56$.
 — 1 d. Left mandible of the same specimen, from below; $\times 82$.
 — 1 e. Left maxillula of the same specimen, from below; $\times 82$.
 — 1 f. Left maxilla of the same specimen, from below; $\times 82$.
 — 1 g. Left maxilliped of the same specimen, from behind; $\times 82$.
 — 1 h. Left fourth thoracic leg of the same specimen, from in front; $\times 56$.
 — 1 i. Left fifth thoracic leg of the same specimen, from in front; $\times 56$.

Fig. 2. *Ascomyzon intermedium* n. sp.

- Fig. 2 a. Female, from above; $\times 39$.
 — 2 b. Last thoracic segment and abdomen of the female, from below; $\times 95$.
 — 2 c. Distal part (fifteenth to twentieth joint) of right antennula; $\times 178$. Setae omitted.
 — 2 d. Left antennula of the female, from below; $\times 93$.
 — 2 e. Left maxillula from the outer side; $\times 93$.
 — 2 f. Left maxilla; $\times 93$.
 — 2 g. Left maxilliped, from in front; $\times 93$.

Fig. 3. *Ascomyzon tenerum* n. sp.

- Fig. 3 a. Female, from above; $\times 43$.
 — 3 b. Abdomen of a female, from below; $\times 105$.
 — 3 c. Head of a female, from the left side; $\times 80$. a^1 . antennula, setae omitted; a^2 . antenna; md . mandibular palp; mx^1 . maxillula; mx^2 . maxilla.
 — 3 d. Left antennula of a female, from below; $\times 80$.
 — 3 e. Left fifth thoracic leg of a female, from below; $\times 175$.
 — 3 f. Left antennula of a male, from below; $\times 93$.
 — 3 g. Antenna of a male; $\times 93$.
 — 3 h. Maxilla of a male; $\times 93$.
 — 3 i. Maxilliped of a male; $\times 93$.
 — 3 k. Last thoracic segment and abdomen of a male, from below; $\times 93$.

Fig. 4. *Ascomyzon abyssi* n. sp.

- Fig. 4 a. Right antennula of the male, from below; $\times 94$. The two distal joints lost and setæ omitted.
 — 4 b. Siphon and some appendages of the same male, from below; $\times 93$. The lettering as in fig. 3 c.
 — 4 c. Left maxilliped of the same male, from in front; $\times 93$.
 — 4 d. Last thoracic segment and abdomen of the same specimen, from above; $\times 93$.

Fig. 5. *Scottocheres gracilis* n. sp.

- Fig. 5 a. Left antennula of a female, from below; $\times 138$. Setæ omitted.
 — 5 b. Maxilla of the same; $\times 138$.
 — 5 c. Maxilliped of the same; $\times 138$.
 — 5 d. Posterior thoracic segments and abdomen of the same, from above; $\times 80$. c. lateral tooth of the genital segment, more highly magnified.

Fig. 5. *Acontiophorus ornatus* Brady & Rob.

- Fig. 6 a. Antennula of a female; $\times 85$.

Fig. 7. *Acontiophorus antennatus* n. sp.

- Fig. 7 a. Posterior thoracic segments and abdomen of a female, from above; $\times 84$.
 — 7 b. Left antennula of the same, from below; $\times 137$.
 — 7 c. Maxilla of the same; $\times 137$.
 — 7 d. Left maxilliped of the same, from in front; $\times 137$.

Fig. 8. *Metapontius latispinis* n. gen., n. sp.

- Fig. 8 a. Female, a little pressed, from above; $\times 35$.
 — 8 b. Posterior part of thorax and the abdomen of the female, from below; $\times 94$.
 — 8 c. Anterior outline of the head of the female, with siphon and left antennula and antenna, from below; $\times 124$.
 — 8 d. Right maxilla of the female, from below; $\times 92$.
 — 8 e. Left maxilliped of the female, from below; $\times 92$.
 — 8 f. Right first thoracic leg of the female, from behind; $\times 100$.
 — 8 g. Left fourth thoracic leg of the female, from in front; $\times 100$.
 — 8 h. Male, from above; $\times 47$.
 — 8 i. Left antennula of the male, from below; $\times 177$.

Plate II.

Fig. 1. *Arctopontius expansus* G. O. S.

- Fig. 1 a. Female, from above; $\times 20$. On the right half of the thoracic segments the ovipositor is indicated in the main by a dotted line.
 — 1 b. Maxilla of the female; $\times 50$.

Fig. 1 c. Maxilliped of the female; $\times 50$.

— 1 d. Left fourth thoracic leg of the female, from in front; $\times 65$.

Fig. 2. *Bradypontius groenlandicus* n. sp.

Fig. 2 a. The three anterior free thoracic segments of a female, from above; $\times 25$.

— 2 b. Last thoracic segment with fifth pair of legs and abdomen of a female, from below; $\times 36$

— 2 c. Left antennula of a female, from below; $\times 84$.

— 2 d. Right antenna of a female, from below; $\times 90$.

— 2 e. Left maxillula of a female, from below; $\times 90$.

— 2 f. Maxilla of a female; $\times 44$.

— 2 g. Distal part of the same maxilla; $\times 167$.

— 2 h. Right maxilliped of a female, from in front; $\times 44$.

— 2 i. Left fourth thoracic leg of a female, from in front; $\times 84$.

— 2 k. Male, from above; $\times 20$.

— 2 l. Left antennula of a male, from below; $\times 84$.

— 2 m. Left fourth thoracic leg of a male, from in front; $\times 84$.

Fig. 3. *Bradypontius dentatus* n. sp.

Fig. 3 a. Female, from above; $\times 20$.

— 3 b. Left antennula of the female, from below; $\times 100$.

— 3 c. Maxilla of the female; $\times 49$.

— 3 d. Distal part of the same maxilla; $\times 200$.

— 3 e. Left maxilliped of the same female, from in front; $\times 49$.

Fig. 4. *Bradypontius unidens* n. sp.

Fig. 4 a. Male, from above; $\times 25$.

— 4 b. Last thoracic segment, with its rudimentary legs, and abdomen of the same male, from below;
 $\times 57$.

— 4 c. Major proximal part of right antennula of the same male, from below; $\times 134$.

— 4 d. Maxilla of the same male; $\times 85$.

— 4 e. Distal part of the same maxilla; $\times 300$. End of the claw lost.

— 4 f. Right maxilliped of the same male, from in front; $\times 85$.

— 4 g. Left fourth thoracic leg of the same male, from in front; $\times 86$.

Fig. 5. *Bradypontius tenuipes* n. sp.

Fig. 5 a. Abdomen and outline of the free thoracic segments of the female, from below; $\times 39$.

— 5 b. Proximal portion of the siphon of the female, from below; $\times 88$.

— 5 c. Maxilla of the female; $\times 89$.

- Fig. 5 d. Distal part of the same maxilla; $\times 206$.
 — 5 e. Left maxilliped, from behind; $\times 89$.
 — 5 f. Last thoracic segment with legs of the female, from below; $\times 128$.

Fig. 6. *Parartotrogus arcticus* G. O. S.

- Fig. 6 a. The two posterior thoracic segments with their appendages of a female, from below; $\times 105$.
 — 6 b. Terminal part of abdomen with the caudal rami of the same female; $\times 155$.
 — 6 c. Right antenna of the female, from below; $\times 105$.
 — 6 d. Maxilla of the female; $\times 105$.

Fig. 7. *Pseudomolgus groenlandicus* n. sp.

- Fig. 7 a. Female (from Godthaab), from above; $\times 24$.
 — 7 b. Posterior part of thorax and abdomen of a female (from Egedesminde), from below; $\times 37$.
 — 7 c. Right antennula of the last-named female, from below; $\times 84$.
 — 7 d. Right antenna of the same female, from below; $\times 130$.
 — 7 e. Right maxillula of the same female; $\times 333$.
 — 7 f. Left first thoracic leg of the same female, from in front; $\times 106$.
 — 7 g. Right fifth leg of the female, from below; $\times 135$.

Fig. 8. *Blakeanus groenlandicus* n. sp.

- Fig. 8 a. Antenna of the female; $\times 80$.
 — 8 b. Left maxillula of the same, from behind; $\times 80$.
 — 8 c. Left maxilla of the same, from behind; $\times 80$.
 — 8 d. Left maxilliped of the same, from behind; $\times 50$.

Plate III.

Fig. 1. *Blakeanus groenlandicus* n. sp. (continued).

- Fig. 1 a. Female, from the left side; $\times 17\frac{1}{2}$.
 — 1 b. Left antennula of a female, from above; $\times 80$.
 — 1 c. Left mandible of the same specimen, from behind; $\times 80$.
 — 1 d. Distal part of the mandible shown in fig. 1 c, from behind; $\times 210$.
 — 1 e. Left first thoracic leg of the same female, from behind; $\times 50$.
 — 1 f. Left fourth thoracic leg of the same specimen, from behind; $\times 50$.
 — 1 g. Exopod of the leg shown in fig. 1 f, from in front; $\times 50$.
 — 1 h. Terminal part of abdomen of the same specimen, from the right side; $\times 50$.

Fig. 2. *Botryllophilus inaequipes* n. sp.

- Fig. 2 a. Left antennula of a female from Stat. 32, from above; $\times 136$.
 — 2 b. Antenna of the same; $\times 136$.
 — 2 c. Right mandible of the same female, from behind; $\times 136$.

- Fig. 2 d. First left thoracic leg of the same female, from in front; $\times 136$.
 — 2 e. Right fourth thoracic leg of the same specimen, from in front; $\times 125$.
 — 2 f. Left fourth thoracic leg of the same specimen; from in front; $\times 125$.

Fig. 3. *Enterocola setifera* n. sp.

- Fig. 3 a. Left antennula of the female, from above; $\times 120$.
 — 3 b. Antenna of the same; $\times 120$.
 — 3 c. Distal part of the left maxilla, from behind; $\times 120$.
 — 3 d. Right maxilliped, from below, in situ; $\times 78$.
 — 3 e. Left maxilliped, from behind; $\times 78$.
 — 3 f. The rami of left first leg, from in front; $\times 85$.
 — 3 g. Fourth pair of thoracic legs, from in front; $\times 44$.
 — 3 h. Left fifth thoracic leg, from in front; $\times 74$.
 — 3 i. Posterior part of the body of the same female, from above; $\times 52$.

Fig. 4. *Lepeophtheirus Hippoglossi* Kr.

- Fig. 4 a. Posterior part of the body of an immature female (from Lat. $62^{\circ}30'$ N., Long. $5^{\circ}10'$ W.), 8 mm. long, caudal rami included, from below; $\times 10$.
 — 4 b. Posterior part of the body of a still younger female, 5 mm. long, from the same locality, from below; scarcely $\times 15$.

Fig. 5. *Dinematura ferox* Kr.

- Fig. 5 a. Male, taken by the "Thor" (see text) from above; scarcely $\times 7/2$.
 — 5 b. Antenna of the same specimen, from above; $\times 14$.
 — 5 c. Distal joints of the same antenna, from behind; $\times 15$.
 — 5 d. Left maxillula of the same male, from below; $\times 46$.
 — 5 e. Left maxilla of the same male, from below; $\times 14$.
 — 5 f. Subdistal part of the same maxilla more highly magnified in order to show the armature of the lateral process and of the proximal portion of the terminal soft part.
 — 5 g. Left maxilliped of the same male, from behind; $\times 13$.

Fig. 6. *Chondracanthus radiatus* O. F. Müll.

- Fig. 6 a. Antennula of the male; $\times 92$.
 — 6 b. Left maxilla of the male; $\times 92$.
 — 6 c. Left maxilliped of the male; $\times 92$.
 — 6 d. First and second thoracic legs, from the side; $\times 75$.
 — 6 e. Posterior part of the body of a male, from below; $\times 92$.

Fig. 7. *Diocus gobinus* O. F. Müll.

- Fig. 7 a. Right antennula and antenna of a male, from the right side; $\times 185$.
 — 7 b. Posterior part of the body of a male, from the right side and with the ventral side upwards; $\times 142$.
 — 7 c. Larva of a male, from below; $\times 92$. The rami of left first leg and the whole right second leg omitted.

Fig. 8. *Diocus trigidus* n. sp.

- Fig. 8 a. Female, from below; $\times 4$.
 — 8 b. The same female from above; $\times 4$. Ovisacs omitted.
 — 8 c. Male, from the left side; $\times 52$. *mx.* maxillula.
 — 8 d. Left antennula and antenna of the same male, from the left side; $\times 121$.
 — 8 e. Left maxilla and maxilliped (*mp*) of the same male, from the left side; $\times 121$.

Fig. 9. *Salmincola alpina* Olsson.

- Fig. 9 a. Right antennula and antenna of a female from Julianehaab, from the outer side; $\times 130$. *a*¹. antennula; *e.* outer protuberance; *f.* lower protuberance; *g.* upper protuberance; *h.* terminal joint.
 — 9 b. Maxillula of the same female; $\times 130$.
 — 9 c. Left maxilliped of the same female, from behind; $\times 130$.
 — 9 d. Right mandible of a female from Myvatn, from behind; $\times 130$.
 — 9 e. Maxillula of the last-named female; $\times 180$.

Fig. 10. *Lernæopoda Centroscyllii* n. sp.

- Fig. 10 a. Left antenna of a female, from the inner side; $\times 66$.
 — 10 b. Left maxilliped of the same female, from behind; $\times 45$.

Plate IV.

Fig. 1. *Lernæopoda Centroscyllii* n. sp.

- Fig. 1 a. Female, from above; $\times 3$.

Fig. 2. *Lernæopoda longicaudata* n. sp.

- Fig. 2 a. Female, from the right side, with the male (*m*) attached at the base of the posterior processes; $\times 12/5$. Distal end of maxillæ with bulla lost. The specimen was gathered by Cand. mag. Ad. Jensen.
 — 2 b. Anterior part of the body with the maxillæ of the specimen secured by Dr. Joh. Schmidt, from above; $\times 6$.
 — 2 c. Head with the proximal part of the maxillæ of the female taken by the "Thor", from below; $\times 13$.
 — 2 d. Anterior part of the head of the same specimen, from above; $\times 21$. *a*¹. antennula; *a*². antenna; *p.* proboscis.
 — 2 e. Posterior part of the body with the proximal portion of the posterior processes of the same specimen; from above; $\times 23$.
 — 2 f. Left antenna of the same specimen, obliquely from the outer side and from below; $\times 46$.

- Fig. 2 g. Proboscis with maxillulæ of the same specimen, obliquely from below and from the left side; $\times 48$.
- 2 h. Left maxilliped of the same specimen, from below; $\times 31$.
- 2 i. Median part of the inner margin of the first joint of the same maxilliped, from below; $\times 127$.
- 2 k. Male found on the female secured by Cand. mag. Ad. Jensen, from the left side; $\times 23$.
- 2 l. Left antenna of the male, from the outer side; $\times 82$.
- 2 m. Left maxillula of the male, from the outer side; $\times 115$.
- 2 n. Left maxilla of the male, from behind; $\times 50$.
- 2 o. Right maxilliped of the male, from behind; $\times 50$.

Fig. 3. *Lernæopodopsis producta* n. gen., n. sp.

- Fig. 3 a. Female, from above; $\times 4$.
- 3 b. Cephalothorax with the proximal part of the maxillæ of the same female, from below; $\times 11$.
mp. maxilliped.
- 3 c. Anterior part of the head, from above; $\times 86$. *a*². antenna.
- 3 d. Anterior part of the head, from below; $\times 138$. *a*¹. antennula; *a*². antenna; *mx*¹. maxillula.
- 3 e. Left maxilliped, from below; $\times 50$.

Fig. 4. *Clavella uncinata* O. F. Müll.

- Fig. 4 a. Distal joint of left antenna of a female taken on the gills of *Gadus callarias* at West Greenland, from above; $\times 145$.
- 4 b. Left maxillula of the same female, from the outer side; $\times 175$.
- 4 c. Left maxilliped of the same female, from below; $\times 83$.
- 4 d. Left antenna of a female taken on a paired fin of *Gadus ogac* at Holstensborg, from below; $\times 138$.
- 4 e. Terminal area of the antenna shown in fig. 4 d, from below; $\times 280$.
- 4 f. Female from the gills of *Macrurus Fabricii*; $\times 9$.
- 4 g. Anterior part of the head of the same female, showing the front margin and the antennæ, from below; $\times 59$.
- 4 h. Second joint of left antenna of the same specimen, from below; $\times 176$.
- 4 i. The joint shown in fig. 4 h, from above; $\times 176$.
- 4 k. Proboscis and left maxillula of a male taken on the gills of *Gadus saïda* from Danmarks Havn, from the left side; $\times 177$.
- 4 l. Maxillæ of the last-named male; $\times 145$.

Fig. 5. *Clavella Stichæi* Kr.

- Fig. 5 a. Head of a female from *Stichæus punctatus* and determined by Krøyer, from below; $\times 136$.
- 5 b. Male on a female taken on *Lumpenus maculatus* in Ønundarfjord (North-West Iceland), from the left side; $\times 169$.

Fig. 6. *Clavella Macruri* n. sp.

- Fig. 6 a. Female taken on *Macrurus Fabricii* by the "Ingolf" at Stat. 35, from the left side; $\times 17/4$.
 — 6 b. Antennula of a female from the "Ingolf" Stat. 27; $\times 94$.
 — 6 c. Antenna of the last-named female; $\times 94$.
 — 6 d. Left maxilliped of the last-named female, from below; $\times 91$.
 — 6 e. Male from the "Ingolf" Stat. 35, from the left side; $\times 80$.
 — 6 f. Antennula, antenna and proboscis with maxillula of the same male, from the left side; $\times 155$.

Fig. 7. *Clavella gracilis* n. sp.

- Fig. 7 a. Female taken on *Polyacanthonotus rostratus* Collett by the "Ingolf" at Stat. 35; $\times 15$.
 — 7 b. Antennula of a female; $\times 210$.
 — 7 c. Antenna of the same female; $\times 210$.
 — 7 d. Right maxillula of the same female, from the outer side; $\times 324$.
 — 7 e. Left maxilliped of the same female, from below; $\times 190$.
 — 7 f. Male, from the left side; $\times 167$.

Plate V.

Fig. 1. *Homooscelis frigida* n. sp.

- Fig. 1 a. Female from the "Ingolf" Stat. 117, from below; $\times 36$.
 — 1 b. Ovisac from the same station; $\times 36$.
 — 1 c. Anterior part of a female from the "Ingolf" Stat. 113, from below; $\times 165$.
 — 1 d. Genital area and caudal rami of the same female, from below; $\times 165$.
 — 1 e. Antenna of a larva from Stat. 113, from below; $\times 345$.
 — 1 f. Maxilla of the same larva, from behind; $\times 345$.
 — 1 g. Maxilliped of a larva from Stat. 117, from in front; $\times 345$.
 — 1 h. Right first leg of a larva from Stat. 117, from the outer side; $\times 345$.

Fig. 2. *Sphaeronella Melphidippæ* n. sp.

- Fig. 2 a. Male, from below; $\times 210$.
 — 2 b. Same male, from the left side; $\times 210$.
 — 2 c. Right maxilla of the same male, from the inner side; $\times 315$.
 — 2 d. Left first leg of the same male, from below and in front; $\times 315$.

Fig. 3. *Sphaeronella Æginæ* n. sp.

- Fig. 3 a. Female, from below; $\times 10$.
 — 3 b. Male, from below; $\times 10$.
 — 3 c. Ovisac; $\times 10$.
 — 3 d. Head of another female, from below; $\times 129$.

Fig. 3 e. Genital area, caudal rami, an entire spermatophore and the stalk of another, of the last-named female; $\times 129$.

— 3 f. Male, from below; $\times 87$.

— 3 g. Same male, from the left side; $\times 87$.

Fig. 4. *Sphaeronella rotundata* n. sp.

Fig. 4 a. Female, from below; $\times 32$.

— 4 b. Male, from below; $\times 32$.

— 4 c. Head of a female, from below; $\times 150$.

— 4 d. Left antennula of the last-named female, from below; $\times 320$.

— 4 e. Genital area and caudal rami of the same female; $\times 200$.

— 4 f. Male, from below; $\times 150$.

Fig. 5. *Sphaeronella Munnæ* n. sp.

Fig. 5 a. Female, from below; $\times 34$.

— 5 b. Anterior part of the body of the same female, from below; $\times 120$.

— 5 c. Genital area with caudal rami of the same female; $\times 209$.

— 5 d. Male, from below; $\times 120$.

Fig. 6. *Sphaeronella Nannonisci* n. sp.

Fig. 6 a. Female, nearly empty, from below; $\times 48$.

— 6 b. Anterior part of the same female, from below; $\times 180$.

Fig. 7. *Sphaeronella Pleurogonii* n. sp.

Fig. 7 a. Female (from Brejddalsvik), from below; $\times 28$.

— 7 b. Male (from Faskrudfjord), from below; $\times 28$.

— 7 c. Ovisac (from Brejddalsvik); $\times 28$.

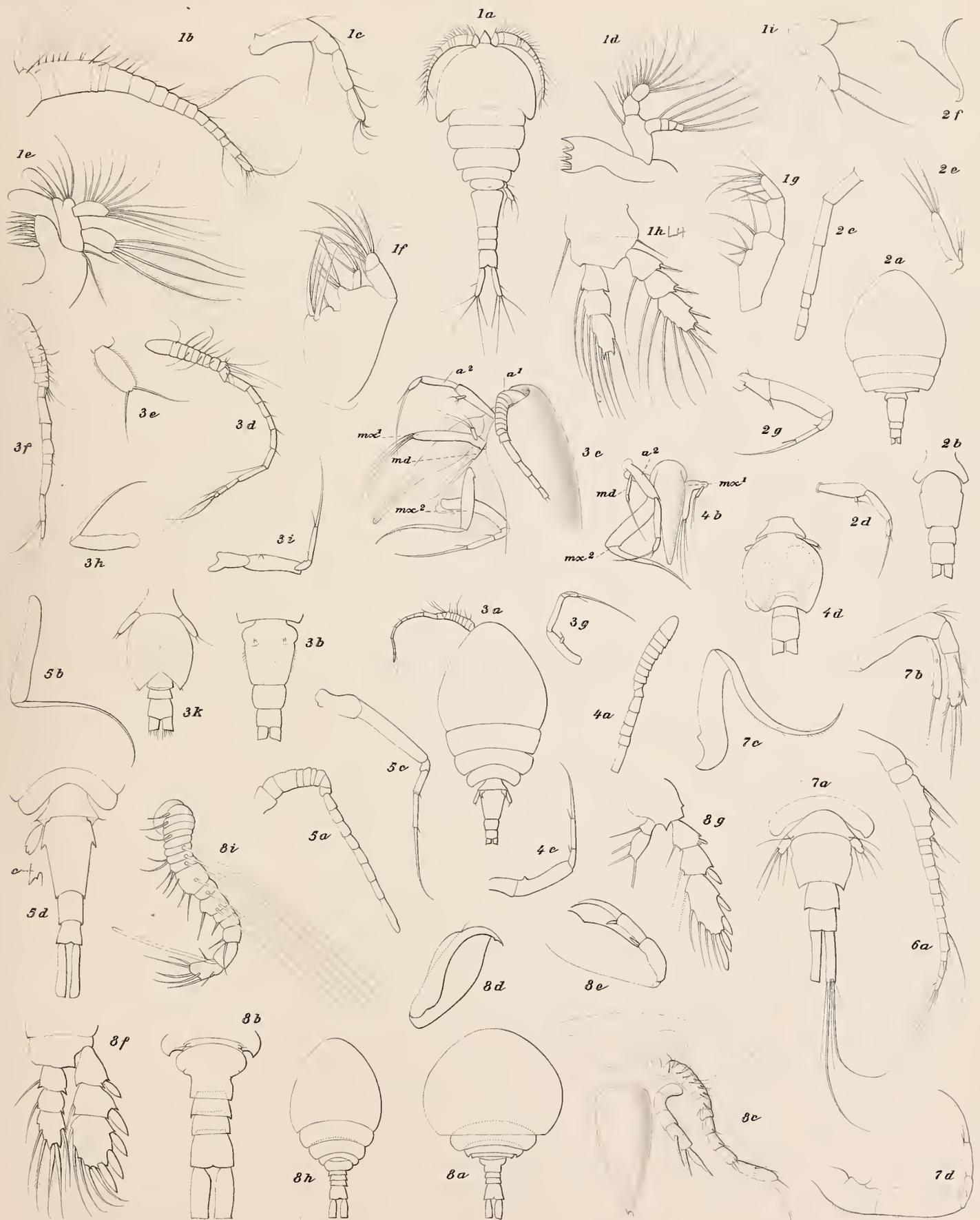
— 7 d. Head of an empty female (from Brejddalsvik), from below; $\times 174$.

— 7 e. Genital area with caudal rami of the last-named female; $\times 225$.

— 7 f. Male (from Faskrudfjord), from below; $\times 213$.

— 7 g. Larva (from Brejddalsvik), from below; $\times 147$. The rami of both pairs of natatory legs omitted.

— 7 h. Pupa (from Faskrudfjord), from below; $\times 187$.



1. *Cyclopina Phallusiae* n. sp. 2. *Aseomyzon intermedium* n. sp. 3. *A. tenerum* n. sp. 4. *A. abyssii* n. sp.
 5. *Scottocheres gracilis* n. sp. 6. *Acontiphorus ornatus* Brady & Rob. 7. *Acont. antennatus* n. sp.

H.J.Hansen del.

8. *Metapontius latispinis* n. gen. n. sp.

Britze sc.



1. *Arctopontius expansus* G.O.S. 2. *Bradypontius groenlandicus* n.sp. 3. *B. dentatus* n.sp. 4. *B. unidens* n.sp.
 5. *B. tenuipes* n.sp. 6. *Parartotrogus arcticus* G.O.S. 7. *Pseudomolgus groenlandicus* n.sp.

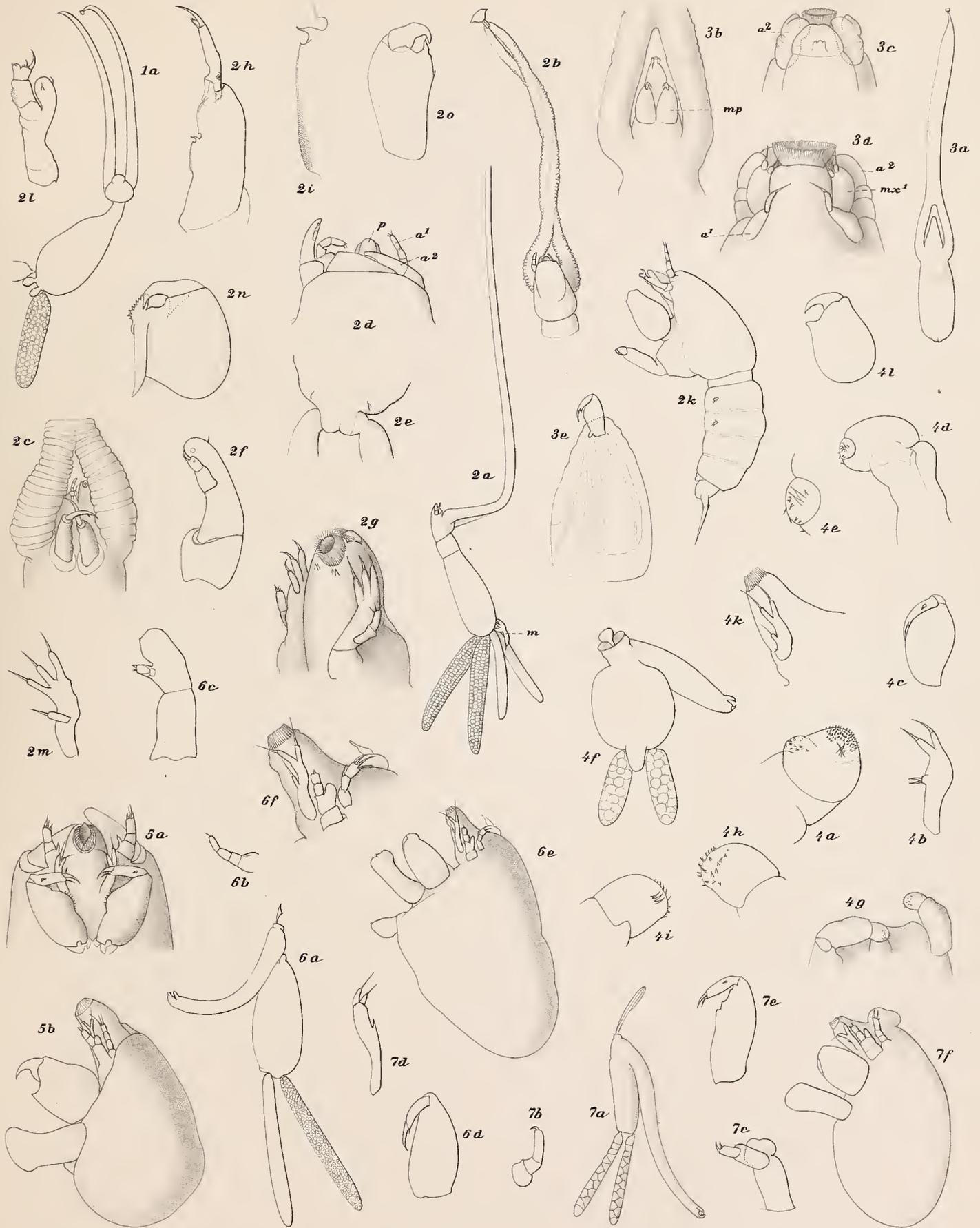
H.J. Hansen del.

8. *Blakeanus groenlandicus* n.sp.

Britze sc.



1. *Blakeanus groenlandicus* n.sp. 2. *Botryllophilus inaequipes* n.sp. 3. *Enterocola setifera* n.sp.
 4. *Lepeophtheirus Hippoglossi* Kr. 5. *Dinematura ferox* Kr. 6. *Chondracanthus radiatus* Müll.
 7. *Diocus gobirus* Müll. 8. *D. frigidus* n.sp. 9. *Salmincola alpina* Ols.
 10. *Lernaeopoda Centroscyllii* n.sp.

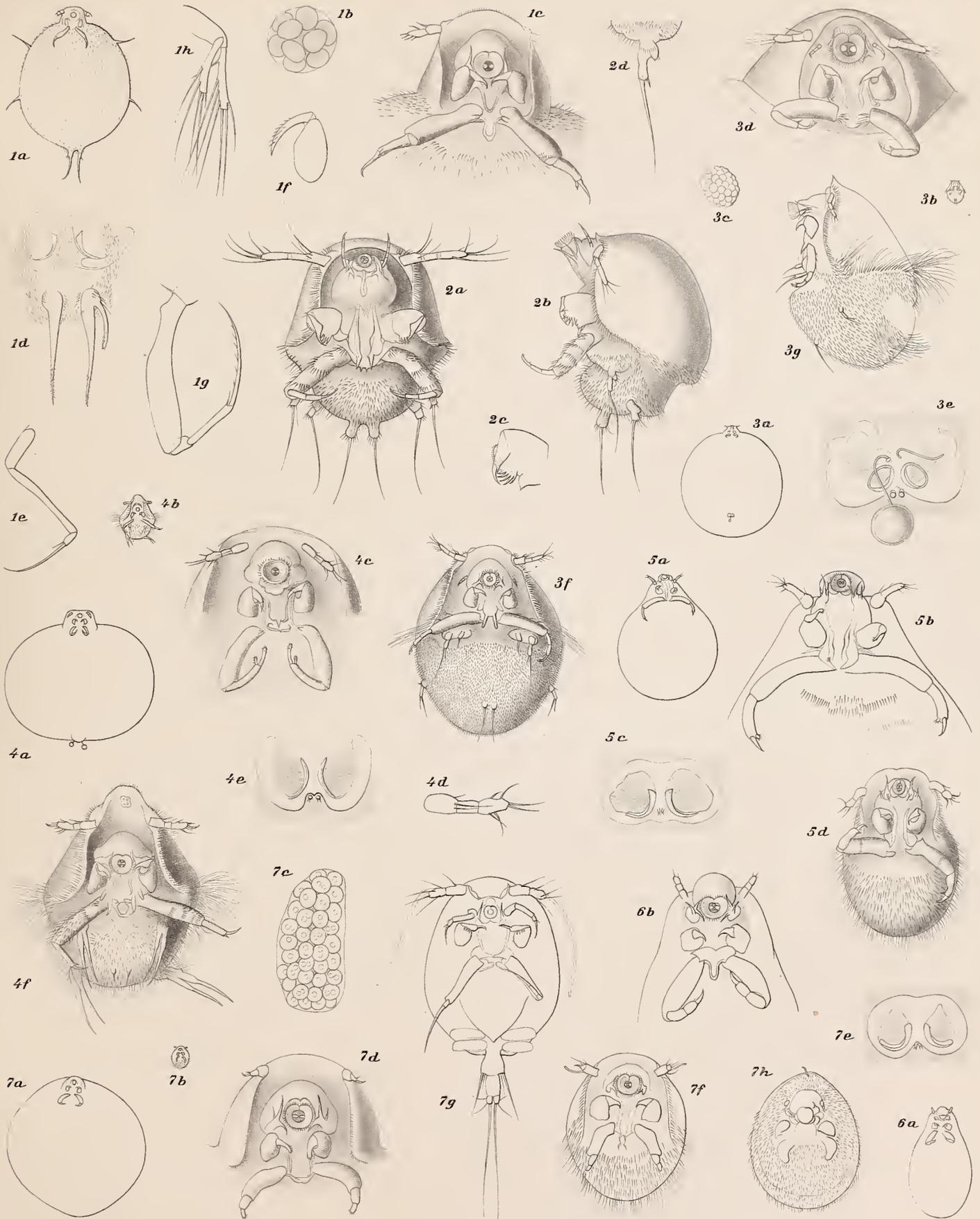


1. *Lernæopoda Centroscyllii* n. sp. 2. *L. longicaudata* n. sp. 3. *Lernæopodopsis producta* n. gen. n. sp.
 4. *Clavella uncinata* Mill. 5. *C. Stichæi* Kr. 6. *C. Macruri* n. sp.

H. J. Hansen del.

7. *C. gracilis* n. sp.

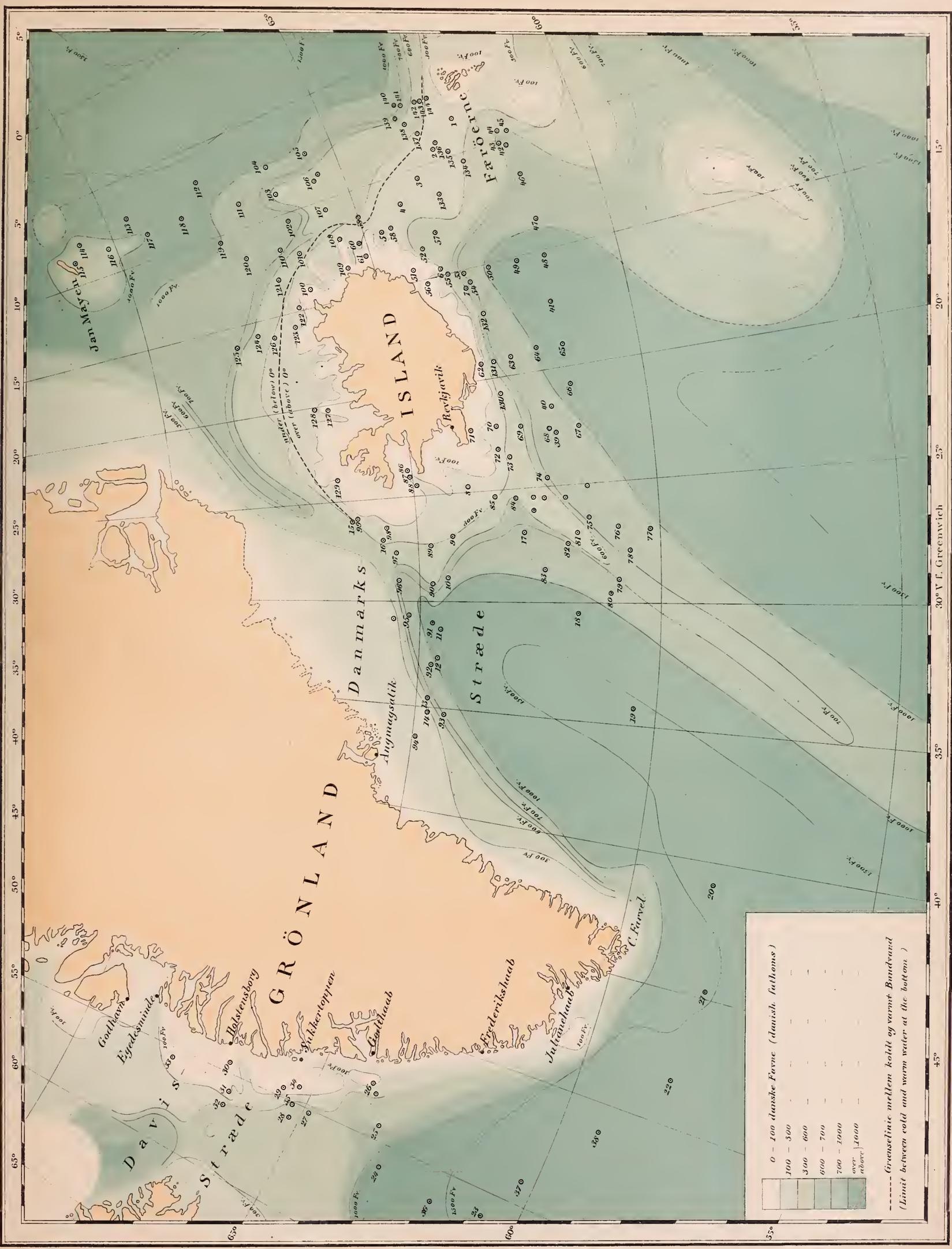
Britze sc.



1. *Homoeoscelis frigida* n.sp. 2. *Sphaeronella Melphidippæ* n.sp. 3. *S. Agincæ* n.sp.
 4. *S. rotundata* n.sp. 5. *S. Munnæ* n.sp. 6. *S. Nannonisci* n.sp.
 7. *S. Pleurogonii* n.sp.

H. J. Hansen del.

Brüze sc.



0 - 100 danske Færne (Danish fathoms)

100 - 300	-
300 - 600	-
600 - 700	-
700 - 1000	-
over 1000	-

----- Grenselinie mellem koldt og varmt Vand
(Limit between cold and warm water at the bottom)

THE INGOLF-EXPEDITION

1895—1896.

THE LOCALITIES, DEPTHS, AND BOTTOMTEMPERATURES OF THE STATIONS

Station Nr.	Lat. N.	Long.W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long.W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long.W.	Depth in Danish fathoms	Bottom-temp.
1	62° 30'	8° 21'	132	7°2	24	63° 06'	56° 00'	1199	2°4	45	61° 32'	9° 43'	643	4°17
2	63° 04'	9° 22'	262	5°3	25	63° 30'	54° 25'	582	3°3	46	61° 32'	11° 36'	720	2°40
3	63° 35'	10° 24'	272	0°5		63° 51'	53° 03'	136		47	61° 32'	13° 40'	950	3°23
4	64° 07'	11° 12'	237	2°5	26	63° 57'	52° 41'	34	0°6	48	61° 32'	15° 11'	1150	3°17
5	64° 40'	12° 09'	155			64° 37'	54° 24'	109		49	62° 07'	15° 07'	1120	2°91
6	63° 43'	14° 34'	90	7°0	27	64° 54'	55° 10'	393	3°8	50	62° 43'	15° 07'	1020	3°13
7	63° 13'	15° 41'	600	4°5	28	65° 14'	55° 42'	420	3°5	51	64° 15'	14° 22'	68	7°32
8	63° 56'	24° 40'	136	6°0	29	65° 34'	54° 31'	68	0°2	52	63° 57'	13° 32'	420	7°87
9	64° 18'	27° 00'	295	5°8	30	66° 50'	54° 28'	22	1°05	53	63° 15'	15° 07'	795	3°08
10	64° 24'	28° 50'	788	3°5	31	66° 35'	55° 54'	88	1°6	54	63° 08'	15° 40'	691	3°9
11	64° 34'	31° 12'	1300	1°6	32	66° 35'	56° 38'	318	3°9	55	63° 33'	15° 02'	316	5°9
12	64° 38'	32° 37'	1040	0°3	33	67° 57'	55° 30'	35	0°8	56	64° 00'	15° 09'	68	7°57
13	64° 47'	34° 33'	622	3°0	34	65° 17'	54° 17'	55		57	63° 37'	13° 02'	350	3°4
14	64° 45'	35° 05'	176	4°4	35	65° 16'	55° 05'	362	3°6	58	64° 25'	12° 09'	211	0°8
15	66° 18'	25° 59'	330	—0°75	36	61° 50'	56° 21'	1435	1°5	59	65° 00'	11° 16'	310	—0°1
16	65° 43'	26° 58'	250	6°1	37	60° 17'	54° 05'	1715	1°4	60	65° 09'	12° 27'	124	0°9
17	62° 49'	26° 55'	745	3°4	38	59° 12'	51° 05'	1870	1°3	61	65° 03'	13° 06'	55	0°4
18	61° 44'	30° 29'	1135	3°0	39	62° 00'	22° 38'	865	2°9	62	63° 18'	19° 12'	72	7°92
19	60° 29'	34° 14'	1566	2°4	40	62° 00'	21° 36'	845	3°3	63	62° 40'	19° 05'	800	4°0
20	58° 20'	40° 48'	1695	1°5	41	61° 39'	17° 10'	1245	2°0	64	62° 06'	19° 00'	1041	3°1
21	58° 01'	44° 45'	1330	2°4	42	61° 41'	10° 17'	625	0°4	65	61° 33'	19° 00'	1089	3°0
22	58° 10'	48° 25'	1845	1°4	43	61° 42'	10° 11'	645	0°05	66	61° 33'	20° 43'	1128	3°3
23	60° 43'	56° 00'	Only the Plankton-Net used		44	61° 42'	9° 36'	545	4°8	67	61° 30'	22° 30'	975	3°0

Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom- temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom- temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom- temp.
68	62° 06'	22° 30'	843	3°4	92	64° 44'	32° 52'	976	1°4	118	68° 27'	8° 20'	1060	-1°0
69	62° 40'	22° 17'	589	3°9	93	64° 24'	35° 14'	767	1°46	119	67° 53'	10° 19'	1010	-1°0
70	63° 09'	22° 05'	134	7°0	94	64° 56'	36° 19'	204	4°1	120	67° 29'	11° 32'	885	-1°0
71	63° 46'	22° 03'	46			65° 31'	30° 45'	213		121	66° 59'	13° 11'	529	-0°7
72	63° 12'	23° 04'	197	6°7	95	65° 14'	30° 39'	752	2°1	122	66° 42'	14° 44'	115	1°8
73	62° 58'	23° 28'	486	5°5	96	65° 24'	29° 00'	735	1°2	123	66° 52'	15° 40'	145	2°0
74	62° 17'	24° 36'	695	4°2	97	65° 28'	27° 39'	450	5°5	124	67° 40'	15° 40'	495	-0°6
	61° 57'	25° 35'	761		98	65° 38'	26° 27'	138	5°9	125	68° 08'	16° 02'	729	-0°8
	61° 28'	25° 06'	829		99	66° 13'	25° 53'	187	6°1	126	67° 19'	15° 52'	293	-0°5
75	61° 28'	26° 25'	780	4°3	100	66° 23'	14° 02'	59	0°4	127	66° 33'	20° 05'	44	5°6
76	60° 50'	26° 50'	806	4°1	101	66° 23'	12° 05'	537	-0°7	128	66° 50'	20° 02'	194	0°6
77	60° 10'	26° 59'	951	3°6	102	66° 23'	10° 26'	750	-0°9	129	66° 35'	23° 47'	117	6°5
78	60° 37'	27° 52'	799	4°5	103	66° 23'	8° 52'	579	-0°6	130	63° 00'	20° 40'	338	6°55
79	60° 52'	28° 58'	653	4°4	104	66° 23'	7° 25'	957	-1°1	131	63° 00'	19° 09'	698	4°7
80	61° 02'	29° 32'	935	4°0	105	65° 34'	7° 31'	762	-0°8	132	63° 00'	17° 04'	747	4°6
81	61° 44'	27° 00'	485	6°1	106	65° 34'	8° 54'	447	-0°6	133	63° 14'	11° 24'	230	2°2
82	61° 55'	27° 28'	824	4°1		65° 29'	8° 40'	466		134	62° 34'	10° 26'	299	4°1
83	62° 25'	28° 30'	912	3°5	107	65° 33'	10° 28'	492	-0°3	135	62° 48'	9° 48'	270	0°4
	62° 36'	26° 01'	472		108	65° 30'	12° 00'	97	1°1	136	63° 01'	9° 11'	256	4°8
	62° 36'	25° 30'	401		109	65° 29'	13° 25'	38	1°5	137	63° 14'	8° 31'	297	-0°6
84	62° 58'	25° 24'	633	4°8	110	66° 44'	11° 33'	781	-0°8	138	63° 26'	7° 56'	471	-0°6
85	63° 21'	25° 21'	170		111	67° 14'	8° 48'	860	-0°9	139	63° 36'	7° 30'	702	-0°6
86	65° 03' ₆	23° 47' ₆	76		112	67° 57'	6° 44'	1267	-1°1	140	63° 29'	6° 57'	780	-0°9
87	65° 02' ₈	23° 56' ₂	110		113	69° 31'	7° 06'	1309	-1°0	141	63° 22'	6° 58'	679	-0°6
88	64° 58'	24° 25'	76	6°9	114	70° 36'	7° 29'	773	-1°0	142	63° 07'	7° 05'	587	-0°6
89	64° 45'	27° 20'	310	8°4	115	70° 50'	8° 29'	86	0°1	143	62° 58'	7° 09'	388	-0°4
90	64° 45'	29° 06'	568	4°4	116	70° 05'	8° 26'	371	-0°4	144	62° 49'	7° 12'	276	1°6
91	64° 44'	31° 00'	1236	3°1	117	69° 13'	8° 23'	1003	-1°0					