THE DANISH

INGOLF-EXPEDITION.

VOL. III B.

PUBLISHED AT THE COST OF THE GOVERNMENT

BY

THE DIRECTION OF THE ZOOLOGICAL MUSEUM OF THE UNIVERSITY.

COPENHAGEN.

H. HAGERUP.

PRINTED BY BIANCO LUNO A/S.

1916–1923.

Contents of Vol. III B.

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5.

CRUSTACEA MALACOSTRACA. III.

BY

H. J. HANSEN.

WITH 16 PLATES AND A LIST OF THE STATIONS.

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By

H. J. Hansen.

V. The Order *Isopoda*.

Introduction.

Before entering on the subject of the present paper I may refer to the "Introductory Remarks" in "Crustacea Malacostraca I" published in 1908, because they contain various statements that need not 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.

Our earlier knowledge of the Isopoda living at the coast of Greenland in depths down to nearly a hundred fathoms was rather good, but as to the fauna of the deeper tracts of the adjacent seas it was extremely poor. In 1913 K. Stephensen enumerated 37 valid species of marine Isopoda, the deep-sea forms included, belonging to the fauna of Greenland. Of the Isopoda from Iceland and the Færoes and the deep sea around these islands our knowledge was very poor; in various papers I have found a number of species also occurring at Greenland, and, besides, in all 9 species recorded which were unknown from the seas of the last-named country. The result is that according to the literature 46 valid species are known from the seas around our northern dependencies. In the present paper 164 species are enumerated, and all, excepting 3 species not seen by me, have been secured by Danish expeditions. The "Ingolf" has gathered 121 of these species, and no less than 74 have been taken only by that expedition; 61 of its species are established as new to science. The "Thor" (Dr. Joh. Schmidt) has secured no less than 46 species, 9 of which have been taken exclusively by this ship, and 4 among these are new. The Ryder-Expedition and the two Amdrup-Expeditions to East Greenland gathered several species, and 3 among them are new; many species, 2 among them new, are due to many other collectors in earlier or in more recent times.

A comparison with the faunas of Norway and Great Britain may be of some interest, as the Malacostraca in the seas at these countries have been more thoroughly investigated than in any other area of our globe. In his "Account" Vol. II (1896—1899) G. O. Sars described 84 valid species of marine Isopoda from Norway (the forms included in his work, but in reality belonging to the Danish fauna and not taken near Norway, I have omitted in this enumeration); of these 84 species, 33 (among them

14 Epicaridea) are unknown from the "Ingolf" area. In 1905 Tattersall enumerated 106 species belonging to the fauna of Great Britain and Ireland, but only 46 of these have been found in the "Ingolf" area, and the majority of the remaining 60 species belong to the so-called Lusitanian fauna, and will never be found at the Færoes or Iceland. The numbers given may show that the seas around our northern dependencies have been proportionately very well explored, but it is quite certain that numerous smaller forms living in the warm area in depths from 400 down to nearly 2000 fathoms have not yet been detected.

On the Literature.

The literature to be taken into consideration is very extensive, but only a little may be said here. Only five works may be enumerated, as they were of special importance to the present task, and in my references their titles have been extremely abbreviated in order to save space.

The main work is G. O. Sars: An Account of the Crustacea of Norway. Vol. II. Isopoda. 1899 (in reality 1896—1899). On the following pages it is quoted a hundred times, and, though some errors and several deficiencies are pointed out, the enormous value of this fine and highly instructive standard work must be emphasized.

G. O. Sars: The Norwegian North-Atlantic Expedition. Crustacea, I. 1885, and II. 1886. — It contains elaborate descriptions of several forms, and a good deal about distribution.

Harriet Richardson: A Monograph on the Isopods of North America. 1905. (Bull. U. S. Nat. Museum, No. 54). The value of this book for the "Ingolf" paper was especially due to its enumerations of geographical distribution, and to its very complete and accurate lists of synonymy. The abbreviation used on the following pages is: Monograph.

W. M. Tattersall: The Marine Fauna of the Coast of Ireland. Part V. Isopoda. 1905. (Fisheries, Ireland, Sci. Invest., 1904. II). This paper contains descriptions with figures of some interesting animals also captured by the "Ingolf" or the "Thor", and statements on the occurrence of numerous species. The abbreviation used by me is: Isopoda.

K. Stephensen: Grønlands Krebsdyr og Pycnogonider (Conspectus Crustaceorum et Pycnogonidorum Groenlandiæ), in "Meddelelser om Grønland. XXII. 1913". This is a useful compilation of all earlier statements in the literature on the occurrence of the animals at Greenland, together with lists of synonymy and distribution outside Greenland. On the following pages it is quoted as: Conspectus.

Results and Questions.

A. The Material.

A comparison of the Isopoda of the "Ingolf" area with the world's fauna of the same order may be of some interest. Calman (1909) divided the Isopoda into six sub-orders; of these the Phreatoicidea have no representative, and of the rich sub-order Oniscoidea only a single species of *Ligia* is to be mentioned. But of the four remaining sub-orders some families, as Asellidæ, Stenetriidæ, Serolidæ, Entoniscidæ and three small families of the sub-order Valvifera are to be discarded; of the big family Cymothoidæ, comprising eight sub-families, only two sub-families, viz. Cirolaninæ and Æginæ occur in our area, and of the large family Sphæromidæ only two genera, each with a single species, have been found. Most, and perhaps all, families or sub-families hitherto not met with within the "Ingolf" area will never be found there, as they exclusively live in less cold areas, or belong to the sub-antarctic or colder temperate parts of the southern hemisphere.

In the following pages no less than 70 new species are described. Of these 4 belong to the sub-order Flabellifera (sens. Calman), 1 to the Valvifera and 4 to the Epicaridea, consequently 61 to the sub-order Asellota. Three of the new Epicaridea are rather interesting, but it can be said that, putting the sub-order Asellota aside, the material comprises only 59 species of the other four sub-orders together, and most of these animals are well-known forms; though, of course, our knowledge of the geographical and bathymetrical occurrence of the majority of these species is considerably expanded.

But the material of the sub-order Asellota comprises 105 species, 61 of which are new. Tattersall had only 32 species of Asellota from Great Britain and Ireland, G. O. Sars 35 species from Norway; consequently the number of species from the "Ingolf" area is astonishing. The explanation is easily given. Most of the Asellota are, like the majority of the rich family Tanaidæ, deep-sea animals, as most of them inhabit depths from 500—700 to 1870 fathoms. The majority of the deep-sea Isopoda hitherto known from all seas together in reality belong to the Asellota, and in spite of the rich gatherings of the "Ingolf" it can safely be concluded that the warm area explored contains a good number of hitherto undiscovered Asellota. Two reasons may be given, viz. that one of the two richest places was Stat. 36, 1435 fathoms, where 17 species of Asellota (two pelagic species not included) were found in less than a liter of sifted bottom material, but the "Ingolf" has very few stations in the warm area with depths from 1000 to 1870 fathoms; furthermore each of no less than 38 of my new species of Asellota was found only at a single station. That the "Ingolf" has gathered a material of deep-sea Asellota which, in proportion to that secured by other deep-sea explorations, is extremely rich, is mainly due to the method of collecting described in my report on the Tanaidacea, p. 3 (1913).

B. Classification and Morphology.

In his extremely valuable hand-book on the Crustacea (1909), Dr. W. T. Calman wrote (p. 218): "The structure of the Isopoda is so diversified. and the number of forms included in the Order is so large, that their classification is a matter of some difficulty". This statement is true, but unfortunately a long time must pass before it will be possible to propose a really satisfactory classification. Calman adopted, with some modifications, that proposed by G. O. Sars, and I adopt Calman's classification with a single additional alteration. But some remarks may be made here.

As already stated, Calman divided the order Isopoda into six sub-orders: Asellota, Phreatoicidea, Flabellifera, Valvifera, Oniscoidea and Epicaridea. The result is that these sub-orders stand as equivalent, but Calman most correctly said that "they are of very unequal value", and pointed out some three instances. The Asellota stand in reality rather apart from the rest; not only does the structure of their pleopods isolate them, but they have preserved some primary features. The antennæ have three joints in the sympod and, generally, a distinct exopod, the squama, which frequently is movable; but among other Isopoda an antennal præcoxa exists only in a few genera, and a squama is found only in *Ligia* (see later on). The coxæ of the thoracic legs, except, generally, those of the first pair, are movable, and besides, never developed as such plates as in Cymothoidæ or Idotheidæ, though sometimes they possess an epimeral process. Finally I have discovered the præcoxa of the maxillipeds well preserved in a couple of genera (see p. 9) but this joint has hitherto not been found in any member of the Malacostraca, excepting *Nebalia*, while it is highly developed, f. inst., in *Apus*. The combination of these primitive features, together with the far from primary but very peculiar development of the two anterior pairs of pleopods, remove the Asellota rather far from the other Isopoda; probably features in inner anatomy or embryology may besides be found to show primary or aberrant characters.

The quite small but very interesting sub-order Phreatoicidea cannot be discussed here. — The families hitherto referred to the Flabellifera are kept together only by the development of their abdominal limbs, but two of them, Gnathiidæ and Anthuridæ, differ much from the three other families: Cymothoidæ (sens. lat.), Serolidæ and Sphæromidæ, which constitute a natural group. In spite of the difficulties I have kept the Anthuridæ in the sub-order, but found it necessary to remove the Gnathiidæ, establishing them as a new sub-order, the Gnathiidea, which even is placed after the Epicaridea, because the family Bopyridæ of the latter sub-order differs considerably less from the Cymothoinæ among the Flabellifera than is the case with the family Gnathiidæ, which in some features differs extremely from all other Isopoda, and, which is of special importance, the most aberrant features found in the structure, sexuel difference, and development of the Gnathiidæ can scarcely be considered as modifications due to parasitism.

The sub-order Valvifera is a most natural group, and the animals are easily separated from the Flabellifera in having the uropods developed as a folding-door covering the pleopods. But whether this single feature can be considered of a value sufficient for separating animals as the Idotheidæ etc. from the Flabellifera is very doubtful and no other external character can be pointed out. Whether any internal character for the Valvifera can be found is questionable; if not, this sub-order may probably be suppressed in a future ameliorated classification.

The sub-order Oniscoidea cannot be discussed here; yet it may be pointed out that the family Tylidæ differs considerably from the others. — The Epicaridea are a most natural sub-order, but the distance between it and some of the Flabellifera is, as already mentioned, not very great.

It has been mentioned that I have now discovered the hitherto unknown præcoxa in maxillipeds in two genera of Asellota. In two genera of the group Munnopsini I found an interesting fusion along the median line of the second pair of pleopods in the male. In *Ligia* I have found the præcoxa and the squama in the antennæ; in a few types belonging to Cymothoidæ and Valvifera three joints in the sympod of first pair of pleopods are pointed out. In *Calathura brachiata* Stimps. an unpaired, probably sensory, organ has been found in the telson; in species of the genus *Macrostylis* a pair of organs, probably sensory, were discovered in the abdomen. These morphological and anatomical features are only briefly enumerated; readers taking interest in them may find them described later on in the remarks on their sub-order, or in the descriptions of the genera or species in question.

C. Geographical and bathymetrical Distribution.

A restricted number of the forms are either decidedly, or most probably, pelagic, viz. *Eurycope Murrayi* Walk., *Paramunnopsis oceanica* Tatt., *Munnopsoides eximius* n. sp., *Pseudomunnopsis Beddardi*

Tatt., *Eurydice Grimaldii* Dollf. and *E. cocca* n. sp., *Idothea metallica* Bosc, the larval stages of *Syscenus infelix* Harg. and of Epicaridea. The species of the sub-family Æginæ are either living on fishes or are found at the bottom, frequently in depths of several hundred fathoms, but probably they frequently swim about looking for a host, while their ovigerous females take no food and live only on the bottom. When speaking of bathymetrical distribution all these animals living either constantly pelagically or during periods of their life as parasites may be put aside.

Nearly all other Isopoda dealt with in the present paper are living during their whole life either on or near the bottom. G. O. Sars has collected large numbers of specimens of the genera *Eurycope*, *Ilyarachna* and *Munnopsis*; he has described their methods of walking and swimming, but according to his statements one must conclude that they constantly live at or near the bottom. I do not know a single instance of any species of these genera, excepting *Eur. Murrayi* Walk., having been taken in any instrument not sunk to or very near to the bottom. It may be possible that some species of the genera *Desmosoma* G. O. Sars and *Nannoniscus* G. O. Sars sometimes may raise from the bottom and swim about, but judging from the fact that only a single specimen of these genera, viz. *Desmosoma chelatum* Steph., has been recorded in the literature as taken pelagically — and even at a station between Elba and Corsica, together with 3 species of *Apseudes* otherwise never before taken in this way — this mode of living must be extremely exceptional, as both genera comprise numerous species. And many Isopoda, f. instance the species of the *Ischnomesus*-group, are certainly quite unable to swim.

A restricted number of Isopoda live either near the shore (*Jæra*) or in depths from very few to 50 or sometimes about a hundred fathoms (*Janira tricornis* Kr., some species of *Munna*, most species of *Idothea*). *Janira maculosa* Leach is most remarkable, as it has been taken in most different depths, from a few down to more than a thousand fathoms, and the specimens inhabiting rather low water differ, as is shown later on, markedly from those captured in the deep sea.

The great majority of the Isopoda from our area are bottom animals living in rather considerable or great depths. The two richest places are the two "Ingolf" stations 78 and 36, both in the warm area. At Stat. 78, 799 fathoms, an enormous quantity of bottom material, especially sponges, was hauled up, and 22 species of Isopoda were found; at Stat. 36, 1435 fathoms, the bottom material did not fill a liter in a sifted condition, but it contained 18 bottom species, and two certainly bathypelagic species were found in the meshes of the trawl. A number of bottom forms were also procured at two other of the deepest stations in the warm area, viz. at Stat. 24, 1199 fathoms, 15 species, and 8 species at Stat. 38, 1870 fathoms. With very few exceptions the forms taken at these four stations belong to the Asellota, and as to this sub-order we arrive at a similar result as that pointed out in my report on the "Ingolf" Tanaidacea on the rich family Tanaidæ, that the richest harvest was yielded by some of the deepest stations south and west of southern Greenland. The only other rich places are the above-named Stat. 78, 799 fathoms, far south-west of Iceland, and Stat. 25, 582 fathoms, in Davis Strait, where 16 species, 12 among them Asellota, were gathered. At the three stations 24, 36 and 38, with depths from about 1200 to 1870 fathoms, together with Stat. 78, were taken in all 33 new species of the Asellota.

Of the total number of Isopoda only 17 species have been taken exclusively in temperatures below zero, and 15 of these in at least 293 fathoms, and generally in greater depths, thus exclusively in the cold deep-sea area, while 2 species have besides been taken in lesser depths. As to the limitation of the warm deep-sea area, I proposed in 1913 that the stations with a depth between 300 and 600 fathoms and the temperature not below 3°, and all stations with depths from 600 to 1870 fathoms and the temperature above zero, might be considered as belonging to the warm area. About 56 of the species (a few merely pelagical species not included) have been taken exclusively in this warm deep-sea area by our Danish expeditions, but of these 8 species are also known from some lesser depths in the Norwegian Fjords or Skager Rak. But a small number of species: *Acanthaspidea typhlops* G. O. Sars, *Munna acanthifera* n. sp., *Haplomesus quadrispinosus* G. O. Sars and *H. angustus* n. sp., *Ilyarachna hirticeps* G. O. Sars, *Eurycope inermis* n. sp., *Eur. brevirostris* n. sp., *E. producta* G. O. Sars, *Munnopsis typica* M. Sars, *Pleuroprion hystrix* G. O. Sars, *Astacilla granulata* G. O. Sars and *Calathura brachiata* Stimps. have been taken both in the real cold deep-sea area and at rather deep or very deep stations in the warm area; three of these species, viz. *Eurycope producta*, *Munnopsis typica* and *Calathura brachiata*, have besides been taken in depths of less than 100 fathoms either near Iceland, Norway, East Greenland or in the Kara Sea, while a fourth species, *Ilyarachna hirticeps*, has been taken at 100 fathoms in Davis Strait and in 10 fathoms at Spitzbergen. *Eurycope inermis* has been taken seven times in the warm area between 362 and 806 fathoms, and nine times in the cold area, in 293 to 1010 fathoms; *Eur. brevirostris* has been taken twice in the cold area and once in the typical warm area. As to the species mentioned of the genera *Ilyarachna*, *Eurycope* and *Munnopsis*, the hypothesis that the animals sometimes live pelagically could at least to some degree explain their occurrence, and that the animals have three pairs of natatory legs, and can swim, is well known, but unfortunately no observation has ever been recorded that any species has been taken pelagically, and the three most common and widely distributed species, *Ilyarachna hirticeps*, *Eurycope inermis* and especially *Munnopsis typica*, are so large, that they could scarcely escape or be overlooked. *Munna acanthifera* has been captured nine times in the warm, and three times in the cold, area, and these stations are very far from the limits between the areas; *Haplomesus quadrispinosus* was taken by the "Ingolf" six times in the cold area in depths from 371 to 1309 fathoms, and three times at some of the deepest stations, 1199 to 1870 fathoms, in the warm area, and as to these two species even the possibility of swimming must be excluded. *Pleuroprion hystrix* G. O. Sars is known from stations decidedly belonging to both areas, but all the stations are not very far from the limits between the areas; as to several of the localities the same is the case with *Astacilla granulata*.

In the report on the Tanaidacea I pointed out similar facts, viz. that 1 species of Apseudidæ and 7 species of Tanaidæ had been taken in both areas; the females of two of these species have no pleopods. In his Conspectus (1913), K. Stephensen attempted to give an explanation of this interesting distribution. He pronounced the submarine ridge between the Shetlands, the Færoes, south-eastern Iceland, and between North-west Iceland and East Greenland to constitute an "absolute line of separation between two deep-sea faunas", so that no deep-sea form living in the warm area can be found in the cold area, and vice-versa; the only exception being some few Echinodermata. Stephensen therefore assumed that the Tanaidacea in question had been taken pelagically when they had been secured in the area, where they normally did not live. In order to support this hypothesis he put together the few records in the literature showing that animals of that order had been taken pelagically, and referred besides to the gatherings of the "Thor" in the Mediterranean and the adjacent parts of the Atlantic. In his later report (1915) on these gatherings we find the following lines (p. 26): "H. J. Hansen mentions, among the Tanaidacea of the Ingolf Expedition . . . certain species, the occurrence of which is contrary to zoogeographical laws, inasmuch as they appear to belong both to the boreal southern and northern arctic ocean deeps off the coast of Greenland". And later: "Dr. H. J. Hansen however, maintains that all Tanaidacea belong to the bottom fauna, despite the fact that the occurrence of the "doubtful" species is very easily explained if they are taken pelagically".

Stephensen's expression: "contrary to zoogeographical laws" is a little too strong, as according to Th. Mortensen a few Echinodermata do not obey the "law"; the term "rule" would have been better, as rules generally are not without exceptions. He is quite right in saying that "the occurrence of the "doubtful" species is very easily explained if they are taken pelagically", but this explanation is only a hypothesis, and we must now examine the foundations for this assumption. All his statements on specimens of the order Tanaidacea shall be taken into account, while his utterances on Cumacea, on a couple of Gammaridea, etc. are discarded as being without the slightest value as to conclusions on Tanaidacea and Isopoda.

In his last-named paper Stephensen enumerated 16 specimens belonging to 3 species of *Apseudes* as taken all at the same place in young-fish trawl with 25 m. wire out, while the depth of the sea was 600–620 m. The statement is valuable in showing that animals of the family Apseudidæ in reality can swim about rather near the surface in a sea of considerable depth. But according to kind information from Dr. Joh. Schmidt the locality in question is situated between Corsica and Elba, about 18 sea-miles from the former, 16 sea-miles from the latter island, and only 5–6 sea-miles from the flat with the depth of 200 m. off Elba. The only other case recorded in the literature of a form of the Apseudidæ having been taken pelagically is found in my report on the Isopoda etc. of the German Plankton-Expedition, where I said (p. 49) that a single very young specimen of *Apseudes* had been taken in the Gulf of Guinea at St. Thomé. Now it must be emphasized that both females and males of the family have their pleopods, judging from their appearance, rather well developed for rowing, though not for vigorous movements, and the two above-named gatherings show that animals of the family have been taken, at least at night, swimming about at a proportionately moderate distance from two islands and not very far from a flat. Otherwise these two instances prove next to nothing. Dr. Joh. Schmidt has hundreds of times used by day, or at evening or night, the young-fish trawl in various depths without coming near the bottom; in this way he explored the seas at Iceland, at the Færoes, and further south in the Atlantic to Morocco and the entire Mediterranean; he never caught a specimen of Apseudidæ very far from any coast, and in reality only the single case mentioned, but animals of the genera *Apseudes* and *Sphyrapus* are so large that they must have been captured among the enormous quantities of Copepoda and other small Crustacea, and are easily discovered in the samples. Furthermore a rather good number of species of *Apseudes*, taken in dredge or trawl at the bottom, are known from the seas explored by Dr. Joh. Schmidt. The explorations of Dr. Schmidt together with the fact that the German Plankton-Expedition d i d n o t t a k e o n e s i n g l e s p e c i m e n o f t h e w h o l e o r d e r i n i t s v e r y n u m e r o u s v e r t i c a l h a u l s i n m o s t d i f f e r e n t d e p t h s show with sufficient clearness that animals of the family Apseudidæ do not live pelagically in such a way that, f. inst., the distribution of *Sphyrapus anomalus* can be explained. This species is known from so cold a locality as the Kara Sea, has been taken in large numbers in Lat. 69° 24.6′ N. off East Greenland in 9—11 fath., along the whole coast of Norway, at two places in the cold area north of Iceland, in large number in 582 fath., in the warm area in Davis Strait, and, besides, at numerous other places.

Then the family Tanaidæ. The whole literature contains two statements that animals of this rich family have been taken pelagically. The most interesting is that of Stappers (1911), who recorded two females of *Pseudotanais forcipatus* and one female of *P. Lilljeborgii* as taken in a vertical haul, 30—0 m., in Lat. 76° 26′ N., long. 60° 55′ E. According to the map in his paper this place is only about 10 sea-miles from the coast of Novaya Zemlya, and the sea there, according to a map in the work on the "Vega" Expedition, is moderately shallow, the depth being between 100 and 180 m. As the females of the two small species of *Pseudotanais* have no pleopods, I venture to say that they cannot swim; they have most probably been clinging to floating seaweed or some other object. Thomas Scott obtained the small *Leptognathia breviremis* in a vertical haul in Loch Fyne, but whether females of this species, with their minute pleopods, are really able to swim is extremely doubtful, and the pelagic capture of the species in that Loch does not prove that it is able to swim or live pelagically for any time. And I think that nobody may suggest that the occurrence of this species of *Leptognathia* at some of the deepest stations in the cold area far south of Jan Mayen, at three of the deepest stations in the warm area in Davis Strait, in both cases a hundred sea-miles or far more from any coast and at one of these stations in each area in a considerable number of specimens, can be explained by the gathering in Loch Fyne, thus near the coast and in shallow water.

In the report on the Tanaidacea I enumerated (p. 5) even 7 species of Tanaidæ, among them *Leptognathia breviremis*, as "taken both in the real cold area and at rather deep or very deep stations in the warm area." The females of five of these species possess more or less developed pleopods, but with the single exception of *L. breviremis* in Loch Fyne they have never been taken in a vertical haul or a young-fish trawl. The females of two of the species have no pleopods, and it is of no importance for the distribution of the species of Tanaidæ that their males have the pleopods very well developed, when these organs are feeble or quite absent in the females. The cases mentioned in my report on the Tanaidacea are in reality so numerous, the distances between the stations in the cold area so far from those in the warm area and vice versa, and, besides, the stations are frequently so extremely far from any coast or from shallow water, that the extremely few observations recorded in the literature on pelagic capture at moderate distance from, or near, the coast cannot be used to explain away the occurrence of the 8 species at the bottom in both areas.

Finally the above-mentioned Isopoda found in both areas. I think it impossible to imagine that *Calathura brachiata* Stimps. and especially typical deep-sea animals as *Munna acanthifera* n. sp. or *Haplomesus quadrispinosus* G. O. Sars can swim only half an hour. *Calathura brachiata* has been taken several times in the warm area down to 799 fathoms, three times in the cold area down to 371 fathoms, and, besides, in the Kara Sea. The two other forms are typical deep-sea animals, both taken three times in the one and several times in the other area; *Munna acanthifera* going down to 762 fathoms in the cold and to 1199 fathoms in the warm area, *Haplomesus quadrispinosus* to 1309 fathoms in the cold and to 1870 fathoms in the warm area. These Isopoda corroborate my results as to the

Tanaidacea; several species of each order live constantly in both areas, as is the case with a few species of Echinodermata. The hypothesis on pelagic occurrence proposed by Stephensen as an explanation must be discarded as untenable. And the zoogeographical "law" that the submarine ridge is an absolute line of separation between two faunas must be reduced, recognized only as a generally very good, most useful and interesting rule, but with a number of exceptions.

Sub-Order *Asellota*.

In 1893 I proposed the theory that three joints in the sympod of all biramous appendages in the Crustacea ought to be considered the primary condition, and showed that this number of joints was still extant not only in various appendages in Phyllopoda and Copepoda, but besides in the antennæ of the Mysidæ and the Asellota, in the maxillulæ of nearly all and in maxillæ of all orders of Malacostraca, in the thoracic limbs of the Leptostraca. But the first of the three joints in question, the *præcoxa*, has hitherto not been pointed out in the maxillipeds and thoracic legs af any species of Malacostraca, excepting the Nebaliidæ. In examining closely the maxillipeds with the corresponding sternite of two large forms of Asellota, viz. *Ianira pulchra* n. sp. and *Munnopsurus giganteus* G. O. S., I discovered the hitherto missing præcoxa (Pl. I, fig. 4 e, *a*, and Pl. XII, fig. 5 a, *pcx.*) as a somewhat small but sharply limited and well chitinized plate between the sternite and the joint generally described as the first. In *Asellus* and in *Munnopsis typica* the præcoxa does not exist. But as it is found in the two genera *Ianira* and *Munnopsurus*, so far distant within the very rich family Parasellidæ, it exists in all probability also in some other forms. In vain I have looked for the præcoxa in representatives of the other sub-orders (excepting Phreatoicidea), but its existence in the Asellota mentioned is, in my opinion, a morphological feature of some importance.

G. O. Sars has pointed out that in *Asellus* the basal part of the maxillipeds is in the female with marsupium produced in a lappet directed backwards, and on his figure of the maxilliped of *Munna Boeckii* a much smaller lappet is seen. This peculiar structure, which is highly developed in the majority of Flabellifera, in the Bopyridæ, etc., seems to be rare within the Asellota.

A feature observed in several genera or groups of genera of the Asellota is partial or complete fusion of segments, and such fusion has, excepting in the abdomen been overlooked in most cases by nearly all authors, who have figured articulations where only a feeble suture or even a transverse impression without suture exists. Some instances may be mentioned here; in the descriptions of genera or groups they shall be treated more fully.

Beddard figured his *Munnopsis australis* and Tattersall his *Munnopsoides Beddardi* as having the three posterior thoracic segments and the abdomen separated by three transverse articulations. These do not exist; the three segments and abdomen are immovably fused, constituting a single piece, and the lines separating them are only impressions, and especially the two anterior of these impressions are, besides, extremely curved, so that f. inst. the impression between the fourth and fifth segments has the part at the dorsal median line far in front of its lateral portions (Pl. XIV, figs. 2 a and 3 a). In *Munnopsis typica* we find a somewhat similar structure, as the three thoracic segments and the abdomen are immovably fused, but the lateral, very oblique lines between them are sutures, while on the median part of the dorsal surface only impressions are found.

The aberrant group Ischnomesini (formerly the genus *Ischnosoma*) shows very interesting fusion of the segments. In all genera the head is immovably united with the first thoracic segment, and the very curved dorsal line between them is only an impression. While in the genus *Ischnomesus* the posterior thoracic segments and the abdomen are movable, with real articulations between them, we find in *Heteromesus* the two posterior segments and abdomen immovably fused, and limited only by dorsal impressions. And the genus *Haplomesus* goes still further, having the extremely long fifth segment fused with the next, so that almost two-thirds of the body is shaped nearly like a stiff stick, with thickenings and impressions on its posterior part. — In the *Haploniscus*-group pronounced fusion of segments is also found.

In 1905 my paper: On the Morphology and Classification of the Asellota-Group of Crustaceans .... (Proc. Zool. Soc. London, 1904, Vol. II) was published. Two main-points in that treatise must be taken up again. It is a well-known fact that the males of this sub-order have five pairs of pleopods, but the females only four pairs, and I pointed out that the three posterior pairs are homologous in the two sexes. Consequently it must be either the first or the second pair which are wanting in the females. As the first existing pair in the female form an undivided operculum in all genera of Asellota excepting *Asellus* (with *Mancasellus* Harg. and *Coecidothea* Pack.), and as in all these genera the first pair in the male have their sympods coalesced in the median line or, in *Stenetrium*, completely fused, I expressed the opinion that it might be concluded that the first pair were present, the second pair wanting in the female. But later I received from Dr. A. Viré three specimens of a most curious animal, *Stenasellus Virei* Dollf., in which the abdomen has its two anterior segments well developed, a feature not distinct in *Asellus* or any marine form of Asellota, but this peculiar structure made it possible to see that the first abdominal segment has in the female no pleopods, while such are found on second segment. *Stenasellus* is more allied to *Asellus* than to any marine genus of the sub-order. The posterior part of the body of *Haplomesus tenuispinis* n. sp. seen from below (Pl. V, fig. 4 f) shows clearly that the female operculum is not attached to the first abdominal segment. And it must now be considered as certain that the females of the Asellota have no pleopods on first abdominal segment, while their first pair, in most genera fused and constituting an operculum without even any vestige of a suture in the median line, are homologous with second pair in the male.

It is seen that in 1904 I was led astray by the fact that in the males the first pair of pleopods are coalesced or fused in the median line (excepting in *Asellus* and other fresh-water forms), while the two male pleopods of second pair are quite independent in all forms examined before 1905 by any author. But in *Pseudomunnopsis Beddardi* Tatt. collected by the "Thor" I have now found pleopods of second pair in the male fused to such a degree that they constitute a large plate without any median suture, and only with a somewhat deep and moderately narrow posterior incision (Pl. XIV, fig. 3 k), and this plate is quite similar to a female operculum, excepting that it has the incision mentioned, in which the small copulatory organs are found. And in another form, *Paramunnopsis oceanica* Tatt., I found the same pair of male pleopods fused in about one-third of their length (Pl. XIII, fig. 11 i), thus intermediate between *Pseudomunnopsis* and the great multitude of genera with the two pleopods of second pair independent to their sternite. The fusion of the second pair of male pleopods in two genera is a very interesting morphological feature.

As already mentioned, the fauna from the "Ingolf" area comprises 105 species, 61 of which are new, and it was deemed necessary to establish 10 new genera. The sub-order is rich, and the general aspect of many of the genera extremely different. The necessity of dividing it into families has long been felt, and some attempts have been made. In his account, G. O. Sars divided the Norwegian forms of the sub-order (or tribe) into five families, while Vanhöffen in his work on the Isopoda (and Tanaidacea) from the German South-Polar Expedition has eight families. In the above-named paper (1905) I critisized the classification of Sars, showing that four of his families are "far from distinct from each other"; based on a number of characters found in the pleopods I divided the sub-order into three families, Asellidæ, Stenetriidæ and Parasellidæ, the two first-named quite small, the third comprising the great majority of forms, in reality uniting the four families of Sars. Especially is his family Desmosomatidæ badly defined, because it comprises forms like *Ischnomesus (Ischnosoma)*, *Nannoniscus*, *Macrostylis* and *Desmosoma*, which, according to many features, are very distant from each other. And such types as *Schistosoma* n. gen. and *Pseudomesus* n. gen. would be very difficult to place in his system. In vain I have attempted to find leading characters in the shape of any organ. As the best example may be taken the mandibles which in *Ianira* and allied genera have the molar process robust, subcylindrical with the end cut off, and passing through a number of types as *Pleurogonium*, *Nannoniscus*, *Macrostylis*, *Desmosoma*, *Ilyarachna* and *Aspidonotus* that process is gradually reduced, more slender, gradually conical and smaller, until it is very small in *Aspidonotus* and disappears in *Munnopsis*. But in *Eurycope cornuta* G. O. S., which by Sars is placed in the same family as the three last-named genera, the molar process is well developed, thick, and differing from that in *Ianira* only in being more obliquely cut off; in *Munnopsurus giganteus* G. O. S., which is closely related to *Eurycope* and by Sars is referred to this genus, the molar process is only a quite low, broad and rounded protuberance.

Every attempt to divide the very numerous genera — of course including those not found in our area — belonging to the four families of Sars into moderately well defined families will, in my opinion, be impossible. But as a kind of arrangement is very desirable I attempt here to subdivide the family Parasellidæ H. J. H. into a somewhat larger number of smaller, but tolerably equivalent, groups. In this way it is possible to arrange genera showing somewhat close relationship into a kind of unit and point out its essential features, and the name "group" is much more neutral and somewhat less exacting as to sharp diagnoses than the name "subfamily" or "family".

Of the three families into which I divided the Asellota, the Asellidæ with its single species *Asellus aquaticus* L. known from Iceland and Greenland is omitted as being not marine. The Stenetriidæ have no representative; all the forms dealt with belong to the family Parasellidæ.

Group I. Ianirini.

Body oblong, considerably depressed. Head free. Eyes frequently present, situated on the upper surface. Antennæ with squama normally developed. Mandibles normal; molar process well developed, directed a little forwards, with the end cut off. Palp of the maxillipeds with second joint considerably or much expanded, and its two distal joints well developed. Thoracic segments freely movable. First pair of legs frequently a more or less prehensile organ; the other pairs of walking legs of moderate length, not increasing in length from second or third to seventh pair; accessory claw always discernible, frequently robust. Uropods always on the lateral or the terminal margin, frequently well developed, biramous, sometimes uniramous and, besides, much reduced.

Remarks. The group comprises *Iæra* Leach, *Ianira* Leach, *Acanthaspidea* Stebb., *Ianirella* Bonn., *Katianira* n. gen. and, besides, several genera not represented in our fauna, such as *Ianiropsis* G. O. S., *Iæropsis* Koehler, *Carpias* Richardson, etc. The genera differ somewhat from each other in the shape of the molar process, and considerably in the development of the first pair of legs, the length and thickness of seventh joint with claw and accessory claw in all legs, the shape of the female operculum and the development of the uropods.

Ianira may be considered the typical and central genus of the group in all characters, while *Ianirella* to some degree, and especially in the abdomen, constitutes a transition to *Pleurogonium* of the group Munnini, and *Katianira* has a quite peculiar development of the first pair of legs. But in spite of differences the genera are on the whole allied, showing gradual differences in the features enumerated from genus to genus.

Iæra Leach.

Only a single species is known from our area.

1. Iæra albifrons Leach.

1780. *Oniscus marinus* O. Fabricius, Fauna Groenl. p. 252 (not *O. marinus* L.)
1814. *Jæra albifrons* Leach, Edinb. Encycl. VII, p. 434.
1838. *Jæra nivalis* Kröyer, Kgl. D. Vid. Selsk. naturv. math. Afhandl. VII, p. 303; Pl. IV, fig. 21.
! 1897. *Jæra marina* G. O. Sars, Account, II. p. 104; Pl. 43.
1905. — — Richardson, Monograph, p. 450, figs. 503—504.
! 1910. *Iæra marina* H. J. Hansen, Vid. Medd. Naturh. For. Kjøbenhavn for 1909, p. 208, figs. 1—8.

G. O. Sars and later authors have discarded the well-known name *albifrons* and applied *marina* O. Fabr. Fabricius undoubtedly described the present species, but referred it to *Oniscus marinus* L. It is impossible to interpret Linné's description, but Miers (1883) referred a collective species of *Idothea* to *O. marinus* L., saying that a specimen of *Idothea* preserved in Linné's collection in the Linnean Soc. London bears the name "*marinus*" "in what is undoubtedly Linnæus's handwriting". For these reasons, and as the name *I. albifrons* is universally known, I prefer now to apply this name.

In 1910 I pointed out that this species varies considerably in outline at Denmark. The specimens from our northern dependencies all belong to the typical form shown in figs. 1 and 3 in my paper quoted and, besides, drawn by Sars.

Occurrence. Taken by the "Ingolf" at four places.

West Greenland: Sukkertoppen, Lat. 65°25′ N., among algæ at the beach; 9 spec.

— — Godthaab, Lat. 64°11′ N.; 1 spec.

North-West Iceland: Isafjord, shallow water; many spec.

Færoes: Trangisvaag; 2 spec.

This species has been taken at West Greenland from Lat. 69°14′ N. to Lat. 61°59′ N. at Godhavn, Claushavn, Holstensborg, Sukkertoppen, Godthaab, Fiskenæs and Frederikshaab. As to the last locality O. Fabricius wrote: "habitat sine numero ad littora inter fucos lapidesque," and it has been recorded as going down to 15 fathoms (H. J. Hansen). At Iceland it has been taken at the western coast far north in Adelvik (by Mag. W. Lundbeck) and far south at Reykjavik (various collectors), on the northern side at Akureyri in Ofjord (by Dr. A. C. Johansen), on the east side in Beru Fjord (by Dr. A. C. Johansen), and at Djupivogr (by cand. mag. H. Jönsson), finally south of Iceland at Vestman-Oerne (by cand. mag. Sæmundsen); it was always taken in shallow water or at the beach. At the Færoes it has also been taken at Thorshavn on the pier.

Distribution. *I. albifrons* is common at Denmark (Meinert), and occurs everywhere in the Baltic, even to the end of the Gulf of Bothnia (test. Apstein). It occurs along the whole coast of Norway, even to Vadsø (G. O. Sars), and is stated to go further eastwards along the northern coast of Europe to Long. 55° E. (Apstein). It is distributed at Great Britain and Ireland, at the northern coasts of Holland, Belgium and France (various authors), and at the coast of la Vendée (Bonnier), but whether it occurs more southwards along the western coasts of Europe seems to be unknown; its existence at Naples in Italy (Carus) seems to me to be extremely doubtful. Finally taken at the east coast of North America from about Lat. 41° N. to 45° N. and at Labrador (Harger).

Ianira Leach.

This genus has not been well understood by most authors. *Henopomus* Kr. is merely a synonym. *Iolella* Richardson with its synonyms *Ianthe* Bovallius and *Tole* — a misprint for *Iole* — cannot be separated from *Ianira* in any natural way; *Iolanthe (Tole) libbyi* Ortm. is only a synonym for *Ianira (Henopomus) tricornis* Kr., and the other species referred to *Iolanthe* differ from the typical forms of *Ianira* only in the degree of the development of the lateral expansions of the thoracic segments and abdomen. Furthermore *Rhacura* Rich. and *Ιærella* Rich. may perhaps be cancelled as genera, and their forms referred to *Ianira*, as I have been unable to find any generic difference worth mentioning between *Ianira* and those two genera in the descriptions and figures published by Harriet Richardson; I am unable to ascribe generic value to characters derived only from the number and size of lateral processes and dorsal tubercles, when no other character can be found in the descriptions.

Ianira, as interpreted here, is a most natural genus, well distinguished from other allied genera by a set of characters. The molar process of the mandibles is strong, subcylindrical or a little broader towards the end (Pl. I, fig. 4 b), directed inwards and distinctly forwards, and with the end cut off transversely. The maxillipeds (Pl. I, fig. 4 c) have the second joint of the "palp" about as broad as the lobe from the second joint — the præcoxa, *a*, not counted —; the epipod is much longer than broad. — First pair of thoracic legs (Pl. I, figs. 4 f—4 g) somewhat shorter than the second, similar in both sexes and built as a kind of prehensile organ, as the fifth joint is considerably thickened, with a number of spines arranged along both sides near the lower margin, while the sixth joint is about two-thirds as long as the fifth, with a very close row of extremely small spines along the prehensile margin. All thoracic legs with the seventh joint short, the claw strong and moderately short, the accessory claw well developed, strong. — In the males the median lamella of the operculum is moderately broad at the base, narrowing considerably towards the middle and widening a little or moderately towards the posterior end. Female operculum not produced backwards, with the median part of the hind margin nearly transverse, or even a little concave. — Uropods from somewhat shorter to somewhat longer than the abdomen; peduncle and rami well developed, spiny.

By these characters combined the genus is sharply defined from *Ianiropsis* G. O. S., *Acanthaspidea* Stebb., *Janirella* Bonn. and other genera. The most interesting characters for species and for sections of species are found in the development of epimeral processes or plates from the basal joint of the thoracic legs; such epimeral processes or plates are visible from above, and take part in shaping the outline of the thorax. It may be useful to give a tabular view of these characters in the seven species found in the "Ingolf" area.

A. Epimeral plates developed at all thoracic segments. The plates are small, never produced into long, acute processes, but bifid at two or three of the segments.
1. *I. maculosa* Leach. 2. *I. alta* Stimp. 3. *I. tricornis* Kr.

B. Epimeral plates completely wanting .... 4. *I. pulchra* n. sp.

C. Epimeral plates developed at the three posterior segments, but wanting at least at second and third segments.
   a. At first segment a long, narrow epimeral process; between the two lamellar processes of fourth segment a small, narrow epimeral process .... 5. *I. laciniata* G. O. S.
   b. No epimeral process at first segment; sometimes a minute epimeral tubercle between the two lamellar processes of fourth segment .... 6. *I. Vilhelminæ* Steph. 7. *I. spinosa* Harg.

2. Ianira maculosa Leach.

(Pl. I, figs. 1 a—1 f.)

1814. *Ianira maculosa* Leach, Edinb. Encycl. VII, p. 434.
? 1846. *Henopomus muticus* Kröyer, in Gaimard, Voy. en Scand. Crust.; Pl. 30, figs. 1 a—1 n.
1847. — — Kröyer, Nat. Tidsskr., Ny Række, Vol. II, p. 366.
! 1897. *Ianira maculosa* G. O. Sars, Account, II, p. 99; Pl. 40.

This species, which at the Færoes has been taken in 6 fathoms, and goes down not only to considerable depths but even to about 1100 fathoms (see later on), shows considerable variation according to the depth where the specimens lived. Specimens taken in depths to nearly 100 fathoms are mottled, with reddish-brown dots, while in specimens from considerable depths such dots have disappeared. But much more important differences are found in the shape of the head and the relative size of the eyes. In specimens taken in comparatively shallow water, down to 70—100 fathoms, the eyes (fig. 1 a) are proportionately very large, with black pigment, and situated close to the lateral margins of the head; the head is not expanded laterally, and its surface is scarcely or slightly excavated along the anterior or the lateral margins. Fig. 1 d exhibits the head of a specimen from my deepest station enumerated below; it is seen that the yellowish-brown eyes are proportionately very much smaller than in the preceding specimen (fig. 1 a), and much removed from the lateral margins; the lateral parts of the head are much expanded and their surface is considerably excavated, so that the margin turns much upwards. Furthermore the surface is excavated transvervely along the front margin, and especially at its middle portion, which is turned much upwards. In all these particulars the two specimens from the deepest station, 1010—1140 fathoms, exceed all other specimens seen by me. Every possible transition between the two heads described and figured is found among my material. Fig. 1 c exhibits as to size of the eyes, their distance from the lateral margins, and the degree of dorsal excavation a specimen intermediate between those shown in fig. 1 a and fig. 1 d, and that specimen was taken in 295 fathoms. — Furthermore the surfaces of the three posterior thoracic segments have the elevations higher and more pronounced in specimens from deep water than in those from shallow water. Finally the shape of the abdomen varies a little, as is seen from a comparison of fig. 1 b, showing the abdomen of the specimen whose head is exhibited in fig. 1 a, with fig. 1 e, which belongs to the same specimen as fig. 1 d; in fig. 1 e the postero-lateral parts of the abdomen are produced a little more backwards, are more protruding, and less evenly rounded than in fig. 1 b, of the specimen with the eyes very large.

Sars said that the female is 7 mm., the male 10 mm. long, but such large males I have not seen. The ovigerous female shown in figs. 1 a—1 b is only 3·9 mm.; the female with marsupium from 295 fathoms (fig. 1 c) is 7·4 mm.; the female from the deepest station (figs. 1 d—1 e) has no marsupium and is 6·5 mm. long, while the male from the same station is 7 mm. My largest ovigerous female, from off Seydis Fjord, 135 fath., is 8·1 mm.; as to eyes and shape of the head this specimen is intermediate between the animals from 295 and from about 1100 fathoms, which shows that the reduction in the size of the eyes, their distance from the lateral margins, and the excavations are not always quite proportional to the depths of their localities.

Fig. 1 f shows the posterior part of the male first pleopods, and their posterior margin differs materially from that in *Janira alta* (fig. 2 d).

Occurrence. Taken by the "Ingolf" at thirteen places.

West Greenland: Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3·8°; 1 spec.

— — Mouth of Ameralik Fjord, Lat. 64°03′ N., 5—70 fath., shells; 5 spec.

Denmark Strait, off Angmagsalik: Stat. 94: Lat. 64°56′ N., Long. 36°19′ W., 204 fath., temp. 4·1°; 1 spec.

Between Angmagsalik and West Iceland: Stat. 95: Lat. 65°14′ N., Long. 30°39′ W., 752 fath., temp. 2·1°; 4 spec.

— — — — Stat. 96: Lat. 65°24′ N., Long. 29°00′ W., 735 fath., temp. 1·2°; 1 spec.

West Iceland: Dyre Fjord, 20 fath., mud; 7 spec.

South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 5 spec.

— - — Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 3 spec.

South of Iceland: Stat. 6: Lat. 63°43′ N., Long. 14°34′ W., 90 fath., temp. 7·0°; 1 spec.

West of the Færoes: Stat. 44: Lat. 61°42′ N., Long. 9°36′ W., 545 fath., temp. 4·8°; 2 spec.

North of the Færoes: Stat. 143: Lat. 62°58′ N., Long. 7°09′ W., 388 fath., temp. ÷ 0·4; 2 spec.

The Færoes: Trangisvaag, between algæ; 1 spec.

It was known from two places off West Grenland, viz. Lat. 72°32′ N., Long. 58°5′ (not 51′) W., 116 fath., stony bottom, and Lat. 66°32′ N., Long. 55°34′ W., 100 fath., stones with Hydroids and Balani (H. J. Hansen). It has been taken by the "Thor" south of Iceland at four stations: Lat. 63°15′ N., Long. 22°23′ W., 116—172 fath.; Lat. 63°18′ N., Long. 21°31′ W., 89 fath.; Lat. 63°5′ N., Long. 20°7′ W., 290 fath., and Lat. 62°11′ N., Long. 19°36′ W., 1010—1140 fms., 2 spec. It is common at the Færoes, where it has been taken about eleven times in depths from 6 fath. to 180 fath. (various zoologists). East of Iceland it has been taken (by Admiral Wandel) off Seydis Fjord, 135 fath., black ooze, 2 large spec., and 9 miles off the coast, 38 fath. (Mag. R. Hørring). Finally it is known from East Greenland: Lat. 69°25′ N., Long. 20°1′ W., 167 fath., large stones and clay; 1 spec. (Ryder Exp.).

Distribution. At Denmark this species has been taken in the northern parts of Øresund, 15—22 fath. (W. Björck) and Storebelt, at various places in Kattegat, 7—15 fath., and in Skager Rak, 100 fath. (H. J. Hansen). It occurs along the whole coast of Norway, generally in 30 to 100 fath. (G. O. Sars); in the Barents Sea, 132 fath. (Max Weber); it is common in the North Sea (Zirwas; Copenhagen Museum), at Great Britain and Ireland, and is taken west of Ireland in depths from 26 to 388 fath. (Tattersall). Finally it is known from the northern coast of France and the south coast of Brittany (Bonnier).

3. **Ianira alta** Stimpson.

(Pl. I, figs. 2 a—2 d).

1853. *Asellodes alta* Stimpson, Smiths. Contrib. to Knowl. VI, p. 41; Pl. III, fig. 30.

! 1880. *Janira* — Harger, Rep. U. S. Comm. Fish and Fisheries, Pt. 6, p. 321; Pl. II and III, figs. 9, 12 and 13.

1905. — — Richardson, Monograph, p. 475, figs. 531—532.

Description. Intermediate between *I. maculosa* Leach. and *I. tricornis* Kr. — The front margin of the head (fig. 2 a) conspicuously concave, with a somewhat short or moderately long median process, which is a little or considerably longer than broad; the antero-lateral part of the head is a little produced, with the corner subacute or obtuse, and the angle between the lateral and the anterior margin measuring distinctly less than 90°. The eyes are small, and far removed from the lateral margins, as the lateral part of the head is considerably expanded.

Thoracic segments at the sides somewhat feebly expanded; the lateral lobes of second to fourth segments with a broad, rather shallow incision dividing the lobe into an anterior, small, distally rounded lappet about as long as broad, and a posterior, broad, obliquely triangular portion (fig. 2 a); the lobe of first segment and of the three posterior segments is undivided and rounded. All segments have a somewhat small epimeral protuberance very visible from above; the epimeral protuberance of first segment is longer than broad, those of second to fourth segments are bipartite, with their posterior lappet from a little to much shorter than their anterior lappet, and when the posterior lappet is small, it is covered by the plate of the segment. (In one of my two specimens, a female, the posterior lappet of these epimeral protuberances is quite small and invisible from above; in the other specimen, a male, the posterior lappet is narrower but only a little shorter than the anterior, and its tip is visible from above). The lateral plates of the three posterior segments are rounded and short; the epimeral protuberances of these segments are small and rounded.

The posterior half of each lateral margin of the abdomen (figs. 2 b and 2 c) is adorned with about eight obliquely triangular saw-teeth, and the margin in each interval between two teeth is bent at the insertion of a strong seta. The median, flatly convex portion of the hind margin protrudes slightly more backwards than the convex postero-lateral part of the abdomen. The uropods (in the male) about as long as the abdomen.

Length of the male 7 mm., of the female without marsupium 6·7 mm.

Remarks. Harger's figure of *I. alta* from above is on the whole good. The species is closely allied to *I. maculosa*, but the last-named species is separated from *I. alta* in having no median frontal process, the antero-lateral angles of the head not produced forwards, rounded, and measuring more than 90°, finally the two incisions on the hind margin of the median lamella of the male abdominal operculum are much deeper and the rounded minute protuberance in each incision considerably smaller in *I. maculosa* (fig. 1 f) than in *I. alta* (fig. 2 d).

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

West of Iceland: Stat. 96: Lat. 65°24' N., Long. 29°00' W., 735 fath., temp. 1·2°; 2 spec.

Distribution. Off the east coast of North America at a number of places between Lat. 38° N. and 44° N., several of the localities not far from the U. States, others in the Bay of Fundy, and, besides, it has been taken far south of Nova Scotia and east of Sable Island; depths 35 to 487 fathoms (Richardson).

4. **Ianira tricornis** Kröyer.

(Pl. I, figs. 3 a—3 b).

?1846. *Henopomus tricornis* Kröyer, in Gaimard, Voy. en Scand., Crust., Pl. 30, figs. 2 a—2 q.

! 1847. — — Kröyer, Nat. Tidsskr. Ny Række, Vol. II, p. 372.

1901. *Tole libbeyi* Ortmann, Proc. Acad. Nat. Sc. Philadelphia, 1901, p. 157, with fig. (*Tole* a misprint for *Iole*).

! 1913. *Janthe libbeyi* Stephensen, Meddelelser om Grønland, Vol. 51, p. 70; Pl. 3.

Description. Stephensen's figures in the paper quoted convey a fairly accurate idea of this species. — The median frontal process is somewhat long; each antero-lateral angle is produced into a well developed process as long as, or a little longer than, broad, and terminating in a spine articulated to its end; each half of the anterior margin between the median and the lateral process is conspicuously convex. Eyes large and close to the lateral margins.

Thoracic segments on the whole somewhat similar to those in *I. alta*, yet presenting some sharp differences. First segment has its lateral lobe much narrower than in *I. alta*, obtuse, as broad as, or a little broader than, the epimeral process, which is longer than the lobe, a little curved, acute. Second and third segments have their lateral plates divided into two lappets by a broad, moderately deep incision with two angles; each lappet is somewhat small and distally rounded, and in each incision are seen two epimeral protuberances, the anterior small and rounded, the posterior much smaller. Fourth segment differs from the third in having its anterior lateral lappet distinctly larger, while the posterior is wanting; the epimeral plate has a well developed anterior protuberance, while the posterior is small or wanting. The lateral plates of the three posterior segments are small and rounded, excepting those of seventh segment, which are produced behind into an acute triangle; the epimeral protuberances at these segments are small but easily seen from above.

The abdomen (fig. 3 a) has each postero-lateral part broadly rounded or subtriangular and produced slightly beyond the flatly convex part of the hind margin between the uropods. The posterior half of each lateral margin (fig. 3 b) is adorned in a most peculiar way, showing some five or six broad and moderately low incisions with a small protuberance terminating in a more or less strong seta at the middle of each incision; each lappet between two incisions is broad or very broad and its rather short lateral margins concave, with the result that the lappet is narrower at the middle than at its nearly straight distal margin. — The uropods about as long as the abdomen.

Length of the largest specimen, an ovigerous female (from Holstensborg) 8·6 mm.

Remarks. *I. tricornis* is easily distinguished from the two preceding species by the antero-lateral processes of the head, each terminating in an articulated spine, by several points in the shape of the thoracic lateral lobes and the epimeral protuberances, and by the curious adornment of the lateral margins of the abdomen. — Kröyer's detailed description is good, but he had evidently examined a female which had the uropods anomalously small, while as a rule the uropods have the same length in both sexes. I have found very few specimens of various species of the genus *Ianira* with either both uropods small, or one uropod much smaller than the other.

Though Ortmann's figure of his *Tole (Iole) libbeyi* is very poor, Stephensen's interpretation is certainly correct, but the latter author overlooked the fact that the animal belongs to the Kröyerian species.

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

Davis Strait: Stat. 29: Lat. 65°34' N., Long. 54°31' W., 68 fath., temp. 0·2°; 3 spec.

— — Stat. 34: Lat. 65°17' N., Long. 54°17' W., 55 fath.; 1 spec.

— — Mouth of Ameralik Fjord, Lat. 64°03' N., 5—70 fath., shells; 5 spec.

It has been taken many times at West Greenland from Lat. 78° N. to Lat. 60°40' N., and several of the localities have been recorded in the literature (H. J. Hansen, Ortmann, Stephensen). The localities may be briefly enumerated: Cape Alexander, 27 fath.; Disko Bay; Hunde-Eiland; Egedesminde, 25, 30—40 and 40 fath.; Northern Strømfjord, 7—20 fath.; Holstensborg, 40 fath.; Sukkertoppen, 30 fath.; Lat. 65°11' N., Long. 53°33' W., 50 fath.; Kangerdluarsuk, 5—15 fath., finally not far from Julianehaab, 22 fath. (many collectors).

At East Greenland it has been taken by the Ist Amdrup Exped. at Tasiusak, Lat. 65°37' N., 15—20 fath. and 20—30 fath., among algæ. Finally the IInd Amdrup Exped. secured it at Jan Mayen, 15 fath. and 50—60 fath. (Already recorded from Jan Mayen by Koelbel).

Distribution. Taken south of Spitsbergen, 70 fath., temp. 0·4° (G. O. Sars); at Lat. 75°49′ N., Long. 24°25′ E., 42 fath., temp. ÷ 1·42°, and Lat. 78°50′ N., Long. 27°39′ E., 10 fath., temp. 0·2° (Ohlin). The statement of G. O. Sars in the 2nd Fram Exp. is too uncertain.

5. **Ianira pulchra** n. sp.

(Pl. I, figs. 4 a—4 h).

Description. Body broad, only about twice as long as broad; the major part of its surface more or less conspicuously set with short, stiff hairs. — The head has the frontal margin considerably excavated (fig. 4 a), and at its middle a rather long rostral process much longer than broad, and with the end subacute or obtuse; no antero-lateral processes are found and the angles are about 90°. Lateral parts of the head strongly expanded, so that the small, black eyes are very remote from the lateral margins.

Thoracic segments without dorsal processes, but their lateral parts are strongly expanded outwards; each lateral plate is cut off transversely, with the angles distinctly, or much, rounded; the plates of second to fourth segment are, besides, deeply bifid. When the animals are seen from above, no epimeral plate or process is observed; at most the first joint of the legs is just perceived at the bottom of the narrow intervals between the lateral plates of the three posterior segments.

Abdomen about half as broad again as long; its lateral margins are nearly straight and very converging backwards; the postero-lateral part outside each uropod is somewhat produced backwards, forming a triangle about twice as broad as long. — The median lamella of the male operculum has its terminal part peculiarly shaped (fig. 4 h), as the inner half of each pleopod is produced in a rounded lobe about as long as broad and directed backwards, while the outer half is a subtriangular lobe directed mainly outwards, with the distinctly concave hind margin nearly transverse, and this outer lobe reaches slightly beyond the base of the inner lobe. — Uropods decidedly shorter than the abdomen.

Length of a large female 9 mm.

Remarks. This fine species is abundantly distinguished by several conspicuous characters from all other forms. The antennulæ may be seen on fig. 4 a. Figs. 4 b—4 e represent the mouth-parts of the left side; these four figures may serve as types for the organs in question of the genus, and their morphological composition is easily understood by aid of the explanation of the plate. It need only be pointed out that the maxilliped (fig. 4 e) possesses the *præcoxa* (*a*) described on p. 9.

Occurrence. Taken by the "Ingolf" at four stations.

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°, numerous spec.

Between Angmagsalik and North-West Iceland: Stat. 95: Lat. 65°14′ N., Long. 30°39′ W., 752 fath., temp. 2·1°; 15 spec.

— — — — — Stat. 96: Lat. 65°24′ N., Long. 29°00′ W., 735 fath., temp. 1·2°; 5 spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 8 spec.

6. **Ianira Vilhelminæ** Stephensen.

1913. *Janira Vilhelminæ* K. Stephensen, Meddelelser om Grønland, Vol. 51, p. 68; Pls. I—II.

This large and robust species is very characteristic. Stephensen's figure of the entire animal renders the species easily recognisable, but as he did not publish any real description, the more important specific characters may be pointed out here.

Description. Surface of the body without granulations or hairs. — The head has the rostral process long, while the sides are somewhat expanded and at each side produced in a broad, moderately long, triangular plate directed forwards and a little outwards, nearly as long as broad and with the end obtuse or subacute; the frontal margin between this plate and the rostrum convex. Eyes small and very distant from the lateral margins.

The lateral part of the thoracic segments rather expanded and produced into lamellar lappets; second to fourth segments with two lappets at each side, and the four remaining segments with a single lappet; all lappets are subtriangular, with the end obtuse, and most of them nearly as long as broad, but those on the two posterior segments are a little longer than broad, distinctly longer than the preceding lappets and directed considerably backwards. Epimeral processes are completely wanting at the four anterior segments, while at the three posterior segments they are seen from above as small, obtuse or acute protuberances situated behind the base of each lappet.

The postero-lateral parts of the abdomen produced at each side of the uropods into a large triangular plate about as long as broad.

Remarks. The marsupium of one of the females is occupied by a species of *Sphæronella*.

Occurrence. Not taken by the "Ingolf". Hitherto known only from Northern Strømfjord, West Greenland at Lat. 67°45′ N., where Dr. V. Nordmann collected a good number of specimens; the depth was 213—218 fath., temp. ÷ 0·7°.

7. **Ianira laciniata** G. O. Sars.
(Pl. I, fig. 5 a).

1872. *Janira laciniata* G. O. Sars, Forh. Vid. Selsk. Christiania for 1872, p. 92.
! 1897. *Ianthe laciniata* G. O. Sars, Account, II, p. 101; Pl. 41.

The figures and description published by Sars convey an excellent idea of this characteristic species, but a correction and an additional observation may be noted. Sars wrote: "Segments of mesosome with the lateral parts laminarly expanded, and each produced into two lanceolate lappets separated by a deep incision, those of the 4 anterior segments subequal, those of the 3 posterior ones rather unequal, the anterior lappet being much the larger". At a first view this seems to be correct, but on a closer examination it is seen that each lateral lamina has two lanceolate lappets only on second to fourth segments, while each of the four other segments have only a single lappet, because the apparently anterior lappet of first segment and the apparently posterior and somewhat small lappet of each of the three posterior segments are in reality marked off by a suture, being epimeral processes (fig. 5 a, *ep, ep*) from the basal joint of the legs. Furthermore a small, very oblong epimeral process (fig. 5 a, *ep*) is seen at the bottom of the cleft between the two lappets of fourth segment.

Most of the upper surface of the animals, especially on the thoracic segments, is finely granulated, and besides in most of the smaller and in some of the subadult or adult specimens clothed with fine hairs, generally short, but some long hairs may be interspersed. When hairs are scarce or wanting they have probably been lost.

Among my rich material not a single female with the marsupium fully developed is found. The largest female (from the "Ingolf" Stat. 35) measures 8·6 mm. from the tip of the rostrum to the middle of the hind margin of the abdomen; the largest male (from the same station) is 7·2 mm.

Occurrence. Taken by the "Ingolf" at six stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 11 spec.
— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3·6°; 11 spec.
— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3·5°; 2 spec.
— — Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3·8°; 1 spec.
— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 2 spec.
West of North Iceland: Stat. 96: Lat. 65°24′ N., Long. 29°00′ W., 735 fath., temp. 1·2°; 1 spec.

Besides it has been gathered three times in Davis Strait, viz.: Lat. 65°45′ N., Long. 54°30′ W., about 200 fath. (Stephensen); Lat. 65°36′ N., Long. 56°24′ W., 349 fath., temp. 3·2° (by Admiral Wandel), and Lat. 63°24′ N., Long. 53°10′ W., 473 fath. (Stephensen).

Distribution. Storeggen bank, off Molde, Norway, 400 fath.; besides off the coast of Nordland and Finmark, 100 to 150 fath. (G. O. Sars).

8. **Ianira spinosa** Harger.

1879. *Janira spinosa* Harger, Proc. U. S. Nat. Mus., Vol. II, p. 158.
! 1880. — — Harger, Rep. U. S. Comm. Fish and Fisheries, Vol. 6, p. 323; Pl. II, fig. 10.
! 1881. *Ianthe speciosa* Bovallius, Bihang till K. Sv. Vet. Akad. Handl., Vol. 6, No. 4, p. 5; Pls. I—III.

This species is easily separated from the preceding forms by the conspicuous pair of dorsal submedian processes on each thoracic segment. The surface of the body generally more or less hairy, but the hairs are much less numerous than in some specimens of *I. laciniata*. — The antero-lateral plates of the head are lanceolate, acute, and from not fully twice to nearly three times as long as broad. Epimeral processes are completely wanting at the lateral lappets of the three anterior thoracic segments; between the two lappets of fourth segment sometimes a minute, triangular epimeral tubercle may be seen. At the base of the hind margin of the lappets of the three posterior segments a small subtriangular epimeral process is always visible, and these processes are seen on Bovallius' fig. 1 as teeth incorrectly not marked off by a suture, and at least those at fifth and sixth segments are distinctly a little longer than according to that figure.

Harger established *J. spinosa* on two small females, 8 mm. long, and published a single figure, viz., the animal from above. Bovallius established *Ianthe speciosa* on a very large male, measuring 21·5 mm. from the tip of the rostrum to the end of abdomen (the end of its processes, I suppose); he had evidently not seen Harger's papers, but in a later treatise (1886) he keeps Harger's and his own form as "probably" two species. In 1887 I stated that *Ianthe speciosa* Bov. is only a synonym for Harger's species. Harriet Richardson, while writing the Monograph, had not seen any specimen. Nothwithstanding this she considered *I. speciosa* to be specifically distinct from Harger's *I. spinosa*, and copied Harger's description and an extract of that given by Bovallius; in a foot-note (p. 460) she added: "Since my manuscript went to press, the types of *I. spinosa* have been sent from Yale University, and I find it distinct from *I. spinosa*", but as she had not seen any specimen referred to *I. speciosa* and not any further material, the statement is of no value. And let us now look at the differences between the figures given by the two authors, and compare them with my material, 8 specimens.

According to Harger's figure his specimens had the antero-lateral processes of the head less diverging, the thoracic lappets proportionately a little shorter and broader than on Bovallius' figure; besides, the abdomen has no subbasal dorsal tubercle on Harger's figure. My largest specimen (from the "Ingolf" Stat. 29) agrees as to these particulars well with Bovallius' fig. 1, but another male from Davis Strait differs more from that large specimen than from Harger's figure as to the direction of the frontal processes and the shape and size of the thoracic lappets. The only feature seemingly affording a specific character is the presence or absence of the dorsal abdominal tubercle. But in my specimens this tubercle varies much as to length and thickness. It is rarely shaped like one of the processes on the posterior thoracic segments; it is generally a little or much lower and somewhat or much thicker than these processes, and in a small specimen, which has the lateral lappets as slender as my largest specimen, the abdominal tubercle is low and very broad. I am inclined to think that Harger's specimens possess the dorsal abdominal process as a low tubercle, and it is to be regretted that Richardson did not say anything on this topic in the foot-note quoted. As a result of my material and the literature I am forced to consider *I. speciosa* Bov. as only a synonym for Harger's species.

It may be added that many of the numerous figures published by Bovallius, and especially those representing mouth-organs, are far from accurate. On the maxillipeds (his fig. 22) he overlooked the two coupling hooks, and the suture or articulation separating the long second joint from its lobe does not exist. On the figure showing the maxillula (fig. 16) and the maxilla (fig. 19) the proximal parts are partly omitted, partly wrong. On fig. 13, exhibiting the distal part of the left mandible, the movable lobe is not marked off, the row of strong setæ shows another aspect and ought not to be interrupted, the molar process is too short. But I found it unnecessary to draw a new set of figures of these appendages, as they did not exhibit differences worth mentioning from those of *I. pulchra.*

My largest specimen, a male from the "Ingolf" Stat. 29, measures 15 mm. from the tip of the rostrum to the base of the uropods, 17 mm. to the end of the abdominal processes; the single female, that with *Sphæronella*, is 12·2 mm., or to the end of the abdominal processes, 13·2 mm.

In a marsupium of a specimen from Davis Strait, Lat. 66°32′ N., I discovered the parasitic Copepod *Sphæronella curtipes* H. J. H. described in my book on the Choniostomatidæ.

Occurrence. Taken by the "Ingolf" at three stations.

Davis Strait: Stat. 31: Lat. 66°35′ N., Long. 55°54′ W., 88 fath., temp. 1·6°; 1/2 spec.

— — Stat. 29: Lat. 65°34′ N., Long. 54°31′ W., 68 fath., temp. 0·2°; 1 spec.

South-East of Iceland: Stat. 4: 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5°; 1 spec.

The species was formerly known from Baffin Bay, Lat. 67°59′ N., Long. 56°33′ W., 98 fath. (Bovallius), and from two places in Davis Strait, viz.: Lat. 66°32′ N., 55°34′ W., 100 fath., and Lat. 65°35′ N., Long. 54°50′ W., 80 fath. (H. J. Hansen). Besides, it has been secured by Admiral Wandel at a place north-west of Iceland: Lat. 66°16′ N., Long. 26°8′ W., 330 fath., temp. ÷ 0·1°, 1 spec.

Distribution. Hitherto known only from Banquereau, Lat. 44°—45° N., about Long. 58° W. (Harger).

Acanthaspidea Stebb.

The name of the genus has been given by Stebbing in 1893 instead of *Acanthoniscus* G. O. Sars, which was preoccupied. Only the type species is to hand.

The genus is allied to *Ianira*, but differs in the following characters. The maxillipeds (Pl. I, fig. 6 a) have the second joint of the palp very moderately expanded, and it is very much narrower than the broad lobe of the second joint. First pair of legs not prehensile, subsimilar to the other pairs; seventh joint of all pairs moderately long (fig. 6 c), the claw somewhat strong and rather long, the accessory claw slender. In the male the median lamella of the operculum (fig. 6 d) tapers from the moderately broad base to near the end, which is slightly widened; female operculum somewhat produced behind. Uropods moderately large, with the exopod quite small.

Janthopsis Bedd. and probably *Jolanthe* Bedd. must be united with *Acanthaspidea*. A revision, based on the study of the appendages, of a good number of genera established in the literature as more or less allied to *Ianira* and *Acanthaspidea*, is much needed.

9. Acanthaspidea typhlops G. O. Sars.

(Pl. I, figs. 6 a—6 e.)

1879. *Acanthoniscus typhlops* G. O. Sars, Arch. f. Math. og Naturv. Vol. 4, p. 434.

! 1885. — — G. O. Sars, North-Atl. Exp. p. 119; Pl. X, figs. 27—30.

Sars has published a detailed description with four figures of the female, but he did not know the male. A few corrections and additions may be given here.

Sars said of the antennæ: "The 2 first joints of the peduncle jut forth on the outer side, as a strong, oblique, outward-directed, spiniform projection", and this description agrees with his fig. 27, but is not correct. Sars has overlooked the first joint, which is very short and without any process; the process from the real second joint is very long, while the "projection" from the third joint is somewhat shorter and not a process, but the nearly spine-shaped exopod or squama marked off by a distinct articulation.

Of the thoracic segments Sars said in the diagnosis: "Epimera on 1st segment simple pointed, on the 3 succeeding segments two-lobed, on the 3 posterior three-lobed". But he did not distinguish between the different nature of some of the lobes. The lobes on the four anterior segments are only lateral expansions of the segments, and real epimeral plates or processes, projecting from the basal joint of the legs, are quite wanting. The three posterior segments are laterally strongly expanded, and each expansion is bifid, so that the two anterior of the "lobes" originate from the segment in question, while the posterior, much shorter lobe (fig. 6 b, *ep*) is an epimeral plate, thus a process from first joint of the leg and, seen from above, well marked off by a transverse suture. It may be added that the lateral lobes of the segments are a little longer, more produced, in my older specimens than in the large female figured by Sars.

The median lamella of the male operculum (figs. 6 d—6 e) tapers, as said above, from the moderately broad base to near the slightly widened end. Each of its pleopods terminates in an inner, distally rounded lobe about as long as broad and an outer somewhat shorter, almost spiniform, acute process directed backwards and a little outwards. — The copulatory organ of each lateral part of the operculum is produced into a thin, long thread reaching nearly to the end of the peduncle of the uropods. The female operculum has been figured by Sars.

According to Sars his large female was 12 mm. long; my largest specimen, a male, is 8·4 mm. — The specimens from the "Ingolf" Stat. 25 are very young, without seventh pair of legs, and they measure only 2—2·1 mm. in length. They differ from developed specimens in having no dorsal tubercles on the thoracic segments, and besides their fifth and sixth segments have the anterior of the lateral lobes still undeveloped, being represented by a feeble angle.

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

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 27 young.

Between Angmagsalik and North-West Iceland: Stat. 95: Lat. 65°14′ N., Long. 30°39′ W., 752 fath., temp. 2·1°; 1 spec.

The species has been recorded from Davis Strait: Lat. 63°24′ N., Long. 53°10′ W., 473 fath. (Stephensen). And the "Thor" has captured it south-west of the Færoes: Lat. 61°15′ N., Long. 9°35′ W. 463—515 fath., 1 spec.

Distribution. Hitherto only recorded from a single station in the sea west of Lofoten, 457 fath., temp. ÷ 0·7° (G. O. Sars).

Ianirella Bonnier.

Description. As to the shape of the body intermediate between *Ianira* and *Pleurogonium*, but somewhat more similar to the latter genus. Head with a rostral process and a pair of long lateral processes (Pl. I, fig. 8 a). Eyes almost rudimentary or wanting. Antennulæ with the peduncular joints well developed and a low number of joints in the flagellum. Antennæ in the main as in *Ianira*; squama distinct. — Mandibles (fig. 8 c), maxillulæ, and maxillæ almost as in *Ianira*; maxillipeds (fig. 8 d) somewhat shorter with second joint broader, fourth joint (second joint of the palp) at most as broad as the lobe from second joint.

Thoracic segments produced into lateral processes or lobes. First pair of legs (fig. 8 e) prehensile, and especially third to fifth joints much thicker than in the following pairs; fifth joint with spines along its prehensile margin; sixth joint about half as long as the fifth and moderately strong; seventh joint conspicuously longer than in *Ianira*, with the claw somewhat slender and the accessory claw very small. The other legs somewhat slender and moderately long; claw and accessory claw nearly as in first pair.

Abdomen with lateral processes, and behind the uropods considerably produced as a triangular part, which is longitudinally excavated below (fig. 8 g). — Operculum in both sexes produced considerably backwards; its median lamella in the male tapering from the base to the end; and the terminal part of each of its pleopods rather narrow, with the end rounded. — The uropods are very small, consisting of two joints, and one of the rami, probably the exopod, is wanting; they are inserted much in advance of the end of the abdomen on its lateral margins.

Remarks. Especially by the length of seventh joint of the thoracic legs, the length and shape of the claw and the minute accessory claw, the shape of abdomen and operculum and finally by the reduced uropods this genus is abundantly distinguished from *Janira*, and by differences especially in the mandibles, the first thoracic legs, the uropods and the male operculum from *Pleurogonium*.

Five species have been established; the "Ingolf" has secured two new species.

10. **Ianirella spongicola** n. sp.

(Pl. I, figs. 7 a—7 c.)

Description. Closely allied to *I. Nanseni* Bonn. Body rather convex, scarcely twice as long as broad, measured to the end of the lateral processes. — The frontal process (fig. 7 a) much shorter than in *I. Nanseni*, only about half as long as the first joint of the antennular peduncle; it terminates in a long spine, and has about two very small spines before the end. No eyes. — The first joint of the antennulæ more than twice as long as broad; the flagellum 7-jointed.

The lateral processes of the head and of the thoracic segments nearly as in *I. Nanseni*, each terminating in a strong, articulated spine and with some thin lateral spines; the only difference as to the processes is that the two processes at each of second to fourth segments are less divergent, and the anterior conspicuously more than half as long as the posterior (comp. fig. 7 b with Bonnier's fig. 1 a). The surface of the body with the same number of processes as in *I. Nanseni*, viz. one on first thoracic segment, two on the head, on fifth to seventh segments and on the abdomen, three processes on second to fourth segments, but all these processes are somewhat or much shorter than in *I. Nanseni*. Fig. 7 b exhibits the major part af third thoracic segment; it is seen that the median process is only about as long as broad, and terminates in a long, articulated spine, while the submedian intermediate pair of spines are considerably smaller; Bonnier's fig. 1 l of fourth segment shows the submedian pair several times larger, even larger than the median process.

The abdomen is more acutely produced (fig. 7 c) than in *I. Nanseni* and has the end acute or subacute; its four pairs of lateral processes are not, as in that species, subequal in size, but third pair are conspicuously larger than the second pair, which are distinctly larger than the first or the fourth.

Length of the largest specimen, a male, 5·5 mm.; a female without marsupium is somewhat smaller.

Remarks. The differences pointed out between my specimens and Bonnier's elaborate representation of *I. Nanseni* — especially those in the length of the rostrum and of the dorsal processes on second to fourth segments — are so strong, that I found it necessary to establish a new species on my two somewhat mutilated specimens.

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

South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1; 2 spec.

11. **Ianirella lævis** n. sp.

(Pl. I, figs. 8 a—8 g.)

Description. The general outline of the body (fig. 8 a) with its lateral processes is in the main as in *I. spongicola* and *I. Nanseni*, but the dorsal surface has no processes or spines, and several other differences are obvious. — The rostrum (fig. 8 b), which is scarcely as long as the sum of the two proximal antennular joints, is somewhat widened towards the middle and here armed at each side with a robust spine; its end is transverse or emarginate, and each angle has a strong spine. Eyes wanting. — First antennular joint (fig. 8 b) about twice as long as broad; the flagellum with 6 joints.

The lateral processes of the head and of the thoracic segments have the terminal spine much smaller than in *I. spongicola*, and frequently minute; the processes are on the whole a little or somewhat shorter than in the preceding species and without lateral spines; the anterior of the two processes at each side of second to fourth segments is much shorter than the posterior.

The abdomen (figs. 8 a and 8 g) is distinctly less produced backwards than in *I. spongicola*, and has its end somewhat narrow and rounded. The four pairs of lateral processes differ extremely in size; third pair are distinctly larger than second, which are much larger than the very small first or fourth pair; each process terminates in an articulated spine.

Length of the largest specimen, a female without marsupium, 4 mm.

Remarks. *I. glabra* Richardson, *I. abyssicola* Richardson and *I. Bonnieri* Stephensen have no dorsal processes, but *I. lævis* differs from them in the shape of the rostrum, the abdominal processes, etc. — At the antero-lateral margins of first thoracic segment the epimera are visible as a low protuberance with a spine; at the postero-lateral margins of the three posterior segments the epimera are generally visible from above as very low, but broad and rounded protuberances; in *I. spongicola* such epimera at the same four segments are also visible from above, but scarcely as conspicuous as in *I. lævis*.

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

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 7 spec.

— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 4 spec.

Katianira n. gen.

Description. Body oblong, rather depressed, in general appearance somewhat similar to *Ianira* (Pl. II, fig. 1 a). — No eyes. Antennulæ with a small number of joints in the flagellum. Antennæ shorter than the antennulæ (Pl. II, fig. 1 c); peduncle apparently 5-jointed, as the first joint has nearly or totally vanished, and the three following joints are short; flagellum with few joints. — Mandibles (Pl. I, figs. 9 a—9 b) differ from those in *Ianira* especially in having the molar process more slender and, besides, tapering to the rather slender end which is obliquely truncate. Maxillipeds (fig. 9 c) have the second joint broad, its lobe broad though narrower than the joint, with two coupling hooks; third joint narrow; fourth joint formed by the complete fusion of two joints, subtriangular, considerably expanded, and a little narrower than the lobe from second joint; fifth joint — answering to the sixth in other genera — long, distally produced inwards and forwards in an oblong lobe. Epipod of very moderate size, oblong.

The thoracic segments laterally produced in plates (Pl. II, figs. 1 a—1 b); first, sixth and seventh segments each with a single lobe; in the four other segments each plate is divided into two lobes by a triangular incision. — Thoracic legs of middle length; first pair in both sexes (figs. 1 d and 1 e) terminate in a fully developed, slender chela; the other pairs have the seventh joint robust and of very moderate length (fig. 1 f), the claw somewhat strong and the accessory claw small and slender.

The abdomen differs from *Janira* in having the part between the uropods very convex and protruding as a transverse plate. — The median lamella of the male operculum (fig. 1 i) is broad, tapering to somewhat from the end, and then scarcely widening; the copulatory organ reaches about to the end of its pleopod (Pl. I, fig. 9 d); the female operculum (fig. 1 h) rounded behind. — The uropods (fig. 1 g) consist of two joints, the first quite short and hidden beneath the dorsal plate of the abdomen, the second somewhat large.

Remarks. *Katianira* shows some resemblance to *Janira*, but differs abundantly in having the antennæ short, the molar process of the mandibles tapering, only four joints in the "palp" of the maxillipeds, a real chela on first pair of legs, and the uropods without exopod.

Only a single species is known.

12. Katianira chelifera n. sp.

(Pl. I, figs. 9 a—9 d; Pl. II, figs. 1 a—1 i.)

Description. Body about two and a half times as long as broad (fig. 1 a), with the surface smooth. — The lateral margins of the head (fig. 1 c) have a longer or shorter portion finely serrate; labrum is visible from above. — The antennulæ nearly reach the posterior margin of first thoracic segment; the first peduncular joint is slightly longer and thicker than the second; flagellum about half as long again as the peduncle, 5-jointed, with second joint about as long as the two following joints together. — Antennæ conspicuously shorter than the antennulæ (fig. 1 c); flagellum shorter than the peduncle, 4-jointed.

Thoracic segments peculiarly adorned, as all the free margins are serrate, being closely set with numerous small processes about equal in length (fig. 1 b); the lateral lobes of the segments are sub-acute, terminating in a conspicuous, articulated spine; on second to fourth segments the lateral lobes of each segment differ much in size and shape, the anterior lobe being considerably shorter and several times narrower than the posterior; on the fifth segment the anterior lobe is about as long as the posterior. — The chela of first legs in the female (fig. 1 e) about four times, in the male (fig. 1 d) more than four and a half times as long as broad; the fingers are considerably shorter than the hand, equal in length, somewhat curved near the end, acute, and the movable finger is conspicuously thicker than the other.

The abdomen (figs. 1 a, 1 g, 1 i) about as long as broad, on each lateral margin with five or six low protuberances, each terminating in a thick, conspicuous spine; besides, the intervals between the three anterior spines adorned with some minute saw-teeth. The protruding lobe between the uropods is less than twice as broad as long, and its moderately convex hind margin has 6—8 small, thin spines. — The operculum is placed somewhat backwards, in the female reaching nearly to, in the male even slightly overreaching, the posterior margin of the abdomen. In the male (fig. 1 i) each pleopod of the median lamella has the posterior margin concave and somewhat oblique, as the distal outer corner is produced into a triangular process directed backwards. The female operculum (fig. 1 h) is slightly longer than broad. — The terminal joint of the uropods a little less than half as long as the abdomen, with some stiff setæ along both margins.

Length of a male 2 mm.; the largest female is without marsupium and nearly 1·8 mm. long.

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

South-West of Iceland: Stat. 78: Long. 60°37′ N., Lat. 27°52′ W., 799 fath., temp. 4·5; 9 spec.

Group II. Haploniscini.

In general appearance somewhat similar to animals among the terrestrial Isopoda, excepting, of course, in having the abdomen not divided into segments. Head free. Eyes wanting. Antennæ without normal squama, frequently with a long process on third joint. Mandibles normal; molar process subcylindrical or thickened towards the end, but otherwise as in *Janira*. Maxillary palp with second joint not expanded, slender; the two distal joints well developed. The three, or at least two, posterior thoracic segments coalesced at least on the dorsal side and immovably coalesced with the abdomen. All thoracic limbs are slender walking legs, with seventh joint at least moderately long, and on the posterior pairs rather long, the claw slender and no accessory claw. Uropoda minute and uniramous, or wanting.

Remarks. The group comprises two genera, one of them new. The animals are very small, smooth, and live in considerable or great depths.

Haploniscus Richardson.

Description. Body more or less depressed. Front margin of the head distinctly sinuate or with a short process. — Antennulæ (Pl. II, figs. 2 a and 4 b) moderately short; first joint thick, twice to four times as thick as, but a little shorter than, the second; flagellum with a low number of joints. Antennæ of very moderate length or rather short; first joint scarcely discernible; third joint with an acute, strong or long process, but whether this process may be a peculiarly developed squama is questionable; fifth joint considerably thicker than the sixth; flagellum shorter than the peduncle. — Mandibles (figured by Sars) nearly as in *Janira*. Maxillipeds (fig. 2 e) with the two proximal joints moderately broad, the lobe from second joint broader than this joint and with few coupling hooks; the joints of the palp slender; epipod large, nearly triangular.

Thoracic segments conspicuously expanded laterally, but their lateral margins are straight or slightly convex in their full length; epimeral processes wanting. The three posterior segments either well marked off from each other and from abdomen towards their lateral margins, while their broad dorsal median parts are coalesced or even fused, or — in *H. armadilloides* — the articulation between fifth and sixth segments seems to be not fully undeveloped, while the two posterior segments and abdomen seem to be immovably coalesced, though moderately distinct sutures between them remain on the broad median dorsal surface. — The legs slender; first pair not prehensile and differing but little from the second pair; the posterior pairs with seventh joint and the claw (fig. 2 f) distinctly longer and thinner than on the anterior pairs; the claw is somewhat or very long (figs. 2 f and 4 c) and instead of an accessory claw a couple of hairs.

Abdomen about as broad as, or considerably broader than, long, and posteriorly truncate, with a tooth or process at the end of each lateral margin. Operculum in the female (figs. 2 l and 4 d) proportionately small, broadly rounded posteriorly. — Median lamella of the male operculum (it is unknown in *H. armadilloides*) broad a little from or at the base (figs. 2 h and 3 f), and tapering considerably to somewhat from the end, its distal part is somewhat widened and peculiar in structure; the copulatory organ of second pleopods produced into an extremely long thread (fig. 2 h, *c*; fig. 3 g). — Uropods very small or nearly rudimentary, consisting of an oblong joint, and sometimes an exceedingly small proximal joint can be discerned (fig. 2 l).

Remarks. In his Account (p. 119) Sars says that *Nannoniscus bicuspis* G. O. S. "is scarcely congeneric" with the type of the genus, *N. oblongus* G. O. Sars, and with *N. caspius* G. O. S., "differing, as it does, considerably, in the structure of both the antennæ and the oral parts, and also in that of the caudal appendages." In 1908 Harriet Richardson established the genus *Haploniscus* with *N. bicuspis* G. O. S. as the type, and described, besides, two new species. In 1914 Vanhöffen added two antarctic species. The "Ingolf" captured three species, two of them new.

13. **Haploniscus bicuspis** G. O. Sars.

(Pl. II, figs. 2 a—2 l).

1877. *Nannoniscus bicuspis* G. O. Sars, Arch. f. Math. og Naturv. Vol. II, p. 352.
! 1885. — — G. O. Sars, North-Atl. Exp. p. 122; Pl. 10, figs. 31—45.

Description. Body rather depressed, in the female from two and a half to two and two-third times as long as broad, in the male (fig. 2 a) about three times as long as broad. — Front margin of the head nearly transverse with a minute protuberance at the middle (fig. 2 b). — The antennulæ, especially their two proximal joints, thicker in the male (fig. 2 b) than in the female (fig. 2 d), in both sexes scarcely reaching the end of the penultimate joint in the antennal peduncles; flagellum in the male 5-jointed, in the female 4-jointed. — Antennæ somewhat less than half as long as the body; the process on the third joint (figs. 2 b, 2 c, 2 d) is robust, somewhat oblong-triangular, acute, projecting upwards and a little or somewhat outwards from the middle of the upper surface of the joint; penultimate peduncular joint much thicker in the male (fig. 2 b) than in the female (fig. 2 d); last peduncular joint without any tooth or process at the end; flagellum with 13 joints.

The three posterior thoracic segments and the abdomen fused on the broad median part of the dorsal surface (fig. 2 a); the limit between sixth and seventh segments generally perceptible, those between fifth and sixth segments and between seventh segment and abdomen are only visible towards the lateral margins.

Abdomen in the female (fig. 2 l) a little broader than long, with the postero-lateral processes only about one-third as long as the distance between them; uropods conspicuous, reaching to a little from the end (fig. 2 l), or nearly beyond the end (fig. 2 k) of the adjacent process; operculum slightly broader than long. — In the male the abdomen is a little longer than broad (figs. 2 a and 2 h); the postero-lateral processes are much larger than in the female, more than half as long as the margin between them, which is incurved just above each uropod (fig. 2 g); the uropods are conspicuous from below, reaching a little beyond the posterior margin (*u* at figs. 2 g and 2 h). — The median lamella of the operculum is suddenly considerably widened a little from the base (figs. 2 h and 2 i), as each lateral margin is excavated near that base; the distal part of the lamella has two pairs of minute angles on the outer margin, respectively a little before and a little behind the middle; the thread of the copulatory organ is almost three times as long as second pleopod (fig. 2 h, *c*).

Length of a female with marsupium 2·5 mm., of a male 2·6 mm.

Remarks. Sars published a detailed description with figures of the female, but he overlooked the dorsal fusion of the segments mentioned, and he had no male.

Occurrence. Taken by the "Ingolf" at fifteen stations, all in cold area.

North of the Færoes: Stat. 141: Lat. 63°22′ N., Long. 6°58′ W., 679 fath., temp. ÷ 0·6°; 8 spec.
— - - — Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0·6°; 10 spec.
— - - — Stat. 139: Lat. 63°26′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; ab. 32 spec.
East of Iceland: Stat. 105: Lat. 65°34′ N., Long. 7°31′ W., 762 fath., temp. ÷ 0·8°; 2 spec.
— - — Stat. 104: Lat. 66°23′ N., Long. 7°25′ W., 957 fath., temp. ÷ 1·1°; 13 spec.
— - — Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 4 spec.
— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 4 spec.
North of Iceland: Stat. 124: Lat. 67°40′ N., Long. 15°40′ W., 495 fath., temp. ÷ 0·6°; 5 spec.
— - — Stat. 125: Lat. 68°08′ N., Long. 16°02′ W., 729 fath., temp. ÷ 0·8°; 3 spec.
North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1·0°; 4 spec.
— - — Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath., temp. ÷ 1·0°; 18 spec.
South of Jan Mayen: Stat. 118: Lat. 68°27′ N., Long. 8°20′ W., 1060 fath., temp. ÷ 1·0°; 2 spec.
— - - — Stat. 117: Lat. 69°13′ N., Long. 8°23′ W., 1003 fath., temp. ÷ 1·0°; ab. 33 spec.
— - - — Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 9 spec.
— - - — Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 12 spec.

Besides, it has been taken East of Iceland at Lat. 65°53′ N., Long. 7°18′ W., 1163 fath., temp. ÷ 1·1° (G. O. Sars).

Distribution. Taken by Sars in the cold area west of Norway at Lat. 63°5′ N., 525 fath., temp. ÷ 1·1°, and at Lat. 69°46′ N., 649 fath., temp. ÷ 0·7°. But when Sars records it from the warm area between Finmark and Beeren Eiland at Lat. 72°27′ N., Long. 20°51′ E., 191 fath., temp. 3·5°, the statement seems to me a little dubious, because this species otherwise has been taken exclusively, and even at 18 stations, in the cold area in from 371 to 1309 fath.; perhaps the specimens from the warm area belong to the following species or to another closely allied form.

14. **Haploniscus spinifer** n. sp.

(Pl. II, figs. 3 a—3 h.)

Description. This species is so closely allied to *H. bicuspis*, that it is sufficient to point out the differences. — The antennulæ with only 4 joints in the flagellum (fig. 3 a). The antennæ have the process on third joint nearer to its base (fig. 3 c) than in *H. bicuspis*; in both sexes the last joint of the peduncle has an oblong tooth or acute process above at the distal end (figs. 3 a—3 b), and the flagellum has only 11 joints. — The median lamella of the male operculum (fig. 3 f) is only about half as long again as broad at the base, the proximal part of the outer margin somewhat convex without the incision found in *H. bicuspis*, and the terminal part of the lamella has its lateral margins convex, without any protruding angle.

Two adult males from the same place (Stat. 22) differ considerably from one another; one is shaped as the male figured of *H. bicuspis* (fig. 2 a), but its postero-lateral processes are much larger (fig. 3 d), each being half as long again as the posterior margin between them. The other male looks almost like a female, as the lateral margins of the body are more convex, and the animal consequently broader in proportion to length, furthermore the antennulæ and antennæ are distinctly more slender, and the postero-lateral processes (fig. 3 e) much shorter, being even shorter than the margin between them.

The largest male measures 2·8 mm. from the front margin to the end of the very long postero-lateral processes. No female with marsupium was secured.

Remarks. The process at the end of the antennal peduncle is the best character between *H. spinifer* and *H. bicuspis*, as the latter species has no trace of any process. A second allied species without any process at the end of the antennal peduncle is *H. retrospinis* Richardson, of which I have examined co-types from the U. S. Nat. Mus.

Occurrence. Taken by the "Ingolf" at three stations, all in the warm area.

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 4 spec.

South of Davis Strait: Stat. 22: Lat. 58°10′ N., Long. 48°25′ W., 1845 fath., temp. 1·4°; 4 spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 11 spec., but most of them very young.

Haploniscus armadilloides n. sp.

(Pl. II, figs. 4 a—4 d).

Female. Body about two and a half times as long as broad, rather convex, and the major part nearly semi-cylindrical; the general appearance reminding one of a minute *Armadillo*. — The sides of the head somewhat expanded outwards and forwards, so that the anterior margin, which has its median part somewhat convex (figs. 4 a—4 b), is conspicuously concave between the middle and the broadly rounded antero-lateral angles. The frontal plate (fig. 4 b) is a rather broad triangle with the apex acute and each lateral margin sinuate. — Antennulæ about as long as the head; flagellum shorter than the peduncle, 3-jointed (fig. 4 b). — Antennæ short, reaching about the posterior angle of first thoracic segment; the first joint could not be made out; the process on third joint is extremely long, slender, acute, projecting outwards and a little forwards from the anterior side of the joint, and reaching to near the end of fifth joint; flagellum a little shorter than the peduncle, 7-jointed.

The articulation between fifth and sixth thoracic segments seems to be not quite undeveloped, while the two posterior segments and the abdomen seem to be immovably coalesced, and the limits between them are on the major part of the upper surface only moderately distinct sutures, but conspicuous towards the lateral margins. On the thoracic legs the claw is longer than the seventh joint (fig. 4 c).

Abdomen more than half as broad again as long (figs. 4 a and 4 d); the postero-lateral processes are small, broader than long, acute; the posterior margin is more convex than in the two preceding species. — The operculum is nearly circular. — The uropods are very small, not reaching the end of the processes; a division into two joints could not be observed.

Length of the largest specimen, a female without marsupium, 1·5 mm.; the other specimen juvenile.

Remarks. In general aspect *H. armadilloides* differs considerably from the two preceding species, and it can roll itself nearly as many terrestrial Oniscidæ. It agrees with *H. bicuspis* in several features, thus in having a peculiar process on third antennal joint, in the postero-lateral abdominal processes, the shape of the uropods, the abdominal operculum, but shows a number of sharp differences, which, at least provisionally, are considered as not being of generic value.

Occurrense. Taken by the "Ingolf" at a single station.

South of Iceland: Stat. 54: Lat. 63°08′ N., Long. 15°40′ W., 691 fath., temp. 3·9°; 2 spec.

Hydroniscus n. gen.

Description. Of this curious genus only the female is known, and it is related to *Haploniscus*. — Body oblong, highly vaulted and contractile into globular form. Head anteriorly with a broad, rounded incision at each side of the moderately broad median part, which is produced as an obtuse process (Pl. II, fig. 5 c). — Antennulæ moderately short; second joint longer than in *Haploniscus*. Antennæ short; third joint without process. — Mandibles (figs. 5 d—5 e) somewhat similar to *Ianira*, but the molar process is more thickened towards the end, and the movable lobe is very strong on the left mandible. Maxillipeds (fig. 5 f) with the two proximal joints and the epipod somewhat broader than in *Haploniscus*, while second and third joints of the palp are still more slender than in that genus.

The three posterior thoracic segments and the abdomen are strongly vaulted (fig. 5 b) and, besides, so completely fused that only two rudiments of articulations between segments are visible on the sides; seen from above the abdomen has the lateral margins somewhat convex and converging to the narrowly rounded end (fig. 5 a); seen from the side (fig. 5 b), the lateral margin terminates in a small, triangular tooth not visible from above, and situated in advance of the somewhat protruding end of abdomen. — Thoracic legs slender, especially the posterior pairs; first pair (figs. 5 g and 5 h) with seventh joint moderately long and rather slender, on the posterior pairs (fig. 5 i) long and very slender; the claw rather long, shorter than seventh joint, and an accessory claw is wanting.

Operculum (fig. 5 k, *o*) subangular before the middle. — Uropods completely wanting.

Remarks. It is easily seen that this genus is closely related to *Haploniscus* in spite of its peculiar aspect. It was impossible to find any vestige of uropods; if lost, their points of attachment must be discoverable.

Only a single species is known.

16. **Hydroniscus abyssi** n. sp.

(Pl. II, figs. 5 a—5 k).

Female. Body three times as long as broad, broadest considerably behind the middle; its surface extremely smooth. — The frontal process of the head (fig. 5 c) about as long as broad; its end broadly rounded; the antero-lateral angles are triangularly protruding. — Antennulæ with the flagellum 5-jointed; the terminal joint very short. — Antennæ somewhat longer than the antennulæ; the proximal joints of the peduncle are very difficult to discern, being placed in a deep excavation limited by the very high lateral plates of the head; last joint of the peduncle longer than the preceding joint; flagellum nearly as long as the peduncle, 9-jointed.

The abdominal operculum a little longer than broad (fig. 5 k, *o*); with a rounded median keel not reaching the base; the terminal margin somewhat short, almost straight. Seen from below (fig. 5 k) the anal doors (*a*) are very conspicuous and reach the hind margin, and near the outer margin of each door the postero-lateral process (*p*) is observed.

Length of the largest specimen, which has no marsupium, 2·8 mm.

Remarks. This interesting species is easily distinguished from all marine Isopoda hitherto known.

Occurrence. Taken by the "Ingolf" at its deepest station.

South-West of Cape Farewell: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 7 spec., most of them very young.

Group III. Munnini.

Body very varying in aspect, but the four anterior thoracic segments conspicuously marked off from the three following segments, and second to fourth segments considerably to very much broader than abdomen, which is less or more produced. Head free. Eyes, if present, situated on lateral protuberances or processes of the head. Antennæ with the squama minute or wanting. — Mandibles with the incisive part, the movable lobe, and at least a few setæ well developed; molar process directed somewhat or even considerably forwards, either shaped nearly as in *Janira* or longer and conspicuously thinner with the end oblique; palp in some genera reduced or wanting. Maxillary palp with second joint from rather broad to slender; the two distal joints well developed. — Thoracic segments movable. First pair of legs prehensile, their fifth joint being spiniferous and at least robust, frequently much thickened. The six following pairs "more or less rapidly increasing in length, simple, ambulatory"; accessory claw generally discernible, sometimes long and strong (*Munna*). — Uropods always situated on or above the lateral margins, and somewhat or considerably in front of the end of abdomen, generally minute and submarginal, but in a few forms strong, long, and with their insertions subdorsal.

Remarks. The group answers to the family Munnidæ G. O. Sars. The "Ingolf" gathered three of the four genera represented in the "Account" of Sars, and instead of the fourth genus, *Paramunna* G. O. S., it has secured a new genus, *Pseudomunna* n. gen. In reality some of the genera, as *Munna* and *Dendrotion*, differ much from each other in a number of features. And gradually several other genera have been discovered in other seas, especially at Kerguelen and in the Antarctic Ocean, so that the group, which answers to three families in Vanhöffen's work (1914), in the future may be divided in a satisfactory way, when those southern forms have been more closely investigated.

Munna Kröyer.

The best information on this difficult genus is found in Sars' "Account"; he pointed out the generic characters and described 5 Norwegian species. Some few corrections and additions to the northern fauna have since been published by myself (1910) and Stappers (1911). In the present paper 7 species from the "Ingolf" area are mentioned, 3 of which are figured in Sars' work, and 2 are new to science.

The species of *Munna* are far from easy to deal with, as most of them show considerable individual variation, and many of the specimens are very mutilated. Variations in armature with spines, in the number of joints in the antennular flagella, etc., are pointed out in the descriptions of, or remarks on, several species on the following pages. An important specific character not mentioned by Sars is the shape of the median lamella of the male operculum; in reality the shape of this lamella, especially its terminal part, affords, perhaps, the sharpest and most reliable character. Besides it may be pointed out that the coxæ, first joint of the thoracic legs, are thick and developed as a kind of epimera which are attached to the lateral end of the segments (Pl. III, figs. 7 b and 7 d) and, especially on the posterior pairs, not always easy to discern from the segments; these coxæ or epimera — generally wanting at first segment — are frequently adorned with a tooth or with spines or processes, and sometimes the lateral margins of the segments are, besides, armed in a similar way.

Sars' diagnosis of the genus must be altered a little. As *M. acanthifera* n. sp. (and *M. truncata* Richardson) are completely without visual organs, the statement of Sars: "Eyes distinct ..." cannot be maintained. As to the first pair of legs a couple of lines in his diagnosis are not quite correct, as in most species there is no appreciable sexual difference in these legs. Finally it may be added that the female operculum has the posterior end rounded; in most species it is furnished with some spines on the proximal half of its ventral surface.

17. **Munna Boeckii** Kröyer.
(Pl. III, figs. 1 a—1 b).

1839. *Munna Boechii* Kröyer, Naturh. Tidsskr. Vol. II, p. 612; Pl. VI, figs. 1—9.
! 1897. — — G. O. Sars, Account, II, p. 107; Pl. 44.

According to Sars, the antennulæ have 6 joints in the flagellum, and four of these joints are long; I have the same number in one of two Norwegian specimens, but only three long and two short joints in the other specimen, and the specimens from the Færoes have only the last-named number. — The coxæ of second to seventh pairs of thoracic legs are armed with spines not mentioned or figured by Sars; the greatest number of spines observed is two on second and seventh, three on third and fourth, and four on fifth and sixth pairs of coxæ, but frequently the number is lower, sinking to one or two on second to fourth pairs, and to two on each of the following pairs.

The abdomen varies somewhat in breadth, but is always pyriform and never slender, being less than half as long again as broad, and generally rather broad; it has always three to five robust spines at each side, placed not in a line, but partly on and partly a little above the lateral margin. — The median lamella of the male operculum (figs. 1 a—1 b) has several small spines irregularly arranged on the proximal half of the ventral surface; the lamella is from almost three times to somewhat more than three times as long as broad, distinctly tapering from somewhat before to somewhat beyond the middle, while its distal part widens again conspicuously to the end, which is as broad as, or even a little broader than, the proximal half and distinctly emarginate, as the hind margin of each pleopod is a little oblique, while a minute tooth directed backwards is seen at its outer angle.

Remarks. This species is easily recognized by the characters pointed out above together with the representation of Sars. Especially the shape of the median lamella of the male operculum is important, as it differs sharply from those in all the following forms excepting *M. Hanseni*. The differences between *M. Boeckii* and *M. groenlandica* n. sp. are pointed out at the last-named species.

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

South-West of Iceland: Stat. 85: Lat. 63°21′ N., Long. 25°21′ W., 170 fath.; 1 spec. (poor).

It has been taken by Dr. Th. Mortensen on three places at the Færoes, viz. off Borö, 20—30 fath., 2 spec. (one spec. in *Myxilla fimbriata*), north-west of Kalsö, 60 fath., 7 spec., and off Nolsö, 100 fath., many spec.

Distribution. West coast of Norway, 20—50 fath. (G. O. Sars); North Sea at Lat. 57°17′ N., Long. 7°47′ E., 27 fath. (Zirwas), and at some places in Scotland (T. Scott). The animals recorded by Meinert from Denmark belong to two other species (H. J. Hansen, 1910).

18. **Munna groenlandica** n. sp.

(Pl. III, figs. 2 a—2 d).

?1846. *Munna Fabricii* Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. XXXI, figs. 1, a—q (partim).
1847. — — Kröyer, Nat. Tidsskr., Ny Række, Vol. II, p. 380 (partim).

Description. As to shape of the body and length of the legs this species is intermediate between *M. Boeckii* and *M. limicola* G. O. S. — The eyes (fig. 2 a) are as large as in *M. Boeckii*. The antennulæ (fig. 2 a) a little longer than in that species; the flagellum has in the adult female most frequently 4, but sometimes only 3, long joints, besides a proximal short and a terminal rudimentary joint (an antennula with the first of the long joints uncommonly long but not divided into two joints is shown in fig. 2 a). — The coxæ of the thoracic legs somewhat less spiniferous than in *M. Boeckii*, generally with a single spine on the anterior pairs and two spines on the four posterior pairs.

The abdomen (fig. 2 b) — the first segment not taken into consideration — is generally a little narrower than in *M. Boeckii*, and is armed at each margin with two small spines, rarely one spine, and in a single female each side possesses four somewhat small spines visible from above. Uropods as in *M. Boeckii*. — The median lamella of the male operculum (figs. 2 c—2 d) is characteristic: somewhat from the base a single pair of large spines are found on the ventral surface, and in the largest male besides two or three spines; the lamella is about three times as long as broad, tapering from considerably before to a little beyond the middle and then with the margins nearly parallel to near the end, which is a little narrower; the terminal margin of each pleopod is deeply concave, as the pleopod terminates in a rounded setiferous lobe, while its outer part is produced into a rather large, triangular, acute process directed backwards.

Length of the largest specimen, a female without marsupium from the Upernivik district, 3·4 mm.; a male from the same place is 3·2 mm. long. An ovigerous female from Egedesminde is 2·7 mm.

Remarks. In the list of the Danish Isopoda, etc. (1910) I had referred the specimens of this species to *M. Boeckii*, but after the discovery of the value of the shape of the median lamella of the male operculum I saw that it is in reality a new species, though none of the characters found in other organs are very valuable, the best being the conspicuously feebler armature with spines on the abdomen. The opercular lamella differs sharply from those in the six other species by the shape of its end.

Occurrence. Not taken by the "Ingolf".

At West Greenland this species has been taken at three places. In the Upernivik district, Lat. ab. 72°47′ N., 3 spec. were secured by Commodore Ryder; at Egedesminde, Lat. 68°42′ N., 1 spec. by Mag. Traustedt. In a bottle labelled: Godthaab (Lat. 64°11′ N.) c. 50 fath., Holbøll, I found 6 specimens of this species among 9 specimens of the real *M. Fabricii*, and they must be considered as determined by Kröyer.

At East Greenland it has been secured at four places, viz.: at Angmagsalik, Lat. 65°30′ N., 2 spec. by Mag. Kruuse; at Tasiusak, Lat. 67°37′ N., 3—5 fath., 5 spec. by the Ist Amdrup Exp.; at Lat. 67°4′ N., at the beach, 2 spec. by the IInd Amdrup Exp.; finally at Danmarks-Ø, Lat. 70°27′ N., 3 spec. by the Ryder Exp.

19. **Munna Hanseni** Stappers.

(Pl. III, figs. 3 a—3 h.)

1911. *Munna Hanseni* Stappers, Crust. Malacost., in Duc d'Orleans, Camp. Arctique de 1907, p. 91.

Description. General aspect of body and limbs nearly as in *M. Boeckii*. — Eye-stalks and eyes together (fig. 3 a, 3 c, 3 d, 3 e) conspicuously smaller than in *M. Boeckii*, generally forming a somewhat conical or at the end broadly rounded protuberance which varies in shape, being from a little longer to conspicuously shorter than broad; the eyes are very reduced, containing only some few facets, or sometimes scarcely any facet can be perceived; the inner contents of the eyes are light brownish and much removed from the cornea. — The antennulæ (figs. 3 a, 3 c and 3 d) always consist of 8 joints, but they vary considerably in length, as in specimens from the "Ingolf" Stat. 44 they are only somewhat more than half as long as the distance between the eyes (fig. 3 a), while in the specimen from Stat. 81 they are even a little longer than that distance (fig. 3 d), and in the specimens from the two other stations they are almost as long; such long antennulæ are, besides, more slender than in specimens from Stat. 44. First peduncular joint is moderately thickened, longer than broad; second joint somewhat or considerably longer than the first; the 5-jointed flagellum with the three intermediate joints more or less long, but varying much as to their relative length; terminal joint very short.

Thoracic segments and coxæ are most frequently scantily haired, but sometimes clothed with numerous hairs. The coxæ of second to fourth pairs of legs with a subconical or rounded protuberance at the middle of their outer margin, but in the small, hairy specimens from Stat 78 these tubercles could not be discovered; the coxæ of the three posterior pairs of legs each with a single spine (fig. 3 b) or sometimes with two spines.

Abdomen (the free basal segment not included) is oblong-ovate (fig. 3 b), broadest much before the middle, not much varying as to breadth and generally about half as long again as broad. On the sides a single pair of spines are found, and in adult specimens the upper surface and the posterior half of the sides have in all about four pairs of long or very long spines, and the posterior margin has a pair of very long, thin spines; some or most of these spines are frequently broken off, and at least sometimes they are partly or entirely wanting in not full-grown specimens. — Uropods about as in *M. Boeckii*.

The median lamella of the male operculum (figs. 3 g—3 h) has no ventral spines, and is somewhat less than three times as long as broad, broadest somewhat from the base, then tapering to the end of the second third of the length, and then very feebly diverging to the end; the hind margin of each pleopod has at the outer margin a minute tooth directed backwards, and is slightly sinuate and oblique so that the margin of the whole lamella is feebly emarginate, especially at the middle; in the specimen from Stat. 81 the lamella is a little more widened towards the end, and its distal part is shaped as in *M. Boeckii*.

Length of a large female with marsupium 3 mm., of a male 2·9 mm.

Remarks. *M. Hanseni* is allied to *M. Boeckii* in most characters, but is instantly distinguished by the reduced eyes; the armature with spines on the abdomen of adult and many not-adult specimens is also characteristic.

Occurrence. Taken by the "Ingolf" at four stations.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 9 small spec.

— - — Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 1 spec.

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°32′ W., 293 fath., temp. ÷ 0·5°; 3 spec.

West of the Færoes: Stat. 44: Lat. 61°42′ N., Long. 9°36′ W., 545 fath., temp. 4·8°; 14 spec.

Distribution. Only known from a place at the south coast of Novaya Zemlya, Lat. 70°20′ N., Long. 56°35′ E., 48 fath. (Stappers).

20. **Munna Kröyeri** Goodsir.

(Pl. III, figs. 4 a—4 b).

1842. *Munna Krøyeri* Goodsir, Edinb. New Phil. Journ. Vol. XXXIII, p. 365; Pl. VI, fig. 6 (teste Sars).

! 1897. — — G. O. Sars, Account, II, p. 109; Pl. 46, fig. 1.

This stout, short-legged species has been well figured and described by Sars; I have examined 6 co-types presented by him. Median lamella of the male operculum (figs. 4 a—4 b) without ventral spines, somewhat more than twice as long as broad, broadest somewhat from the base and tapering considerably somewhat from the end, where it widens rather rapidly to the end; the outer distal angle is produced into a moderately small, oblong-triangular, acute process directed backwards and mainly outwards; the hind margin of each pleopod somewhat sinuate, in the main vertical on the median line.

Remarks. Sars in 1882 and in the "Account" says that a number of Kröyer's figures of his *M. Fabricii* belong to *M. Fabricii* Kr., G. O. Sars, and others to *M. Kröyeri* Goods., Sars. This statement led me astray in my list of the Malacostraca from West Greenland (1887), and in following Sars I made erroneous statements. Having now, assisted by "Account" and a rich material, studied the whole matter and examined again the specimens from Greenland determined by Kröyer, I have arrived at the result that some of these specimens belong to *M. Fabricii* Kr. but not *M. Fabricii* G. O. S. which in 1910 I gave the new name *M. minuta*, furthermore that the other specimens of Kröyer do not belong to *M. Kröyeri* Goods., Sars, but to *M. groenlandica* n. sp. (see above). The statements on the species of *Munna* in my list from 1887 and most of those in Stephensen's "Conspectus" ought in future to be left out of consideration.

Occurrence. Not taken by the "Ingolf".

Among the whole material of *Munna* from our area, I found only a single male, taken by cand. mag. Sæmundsen at Vestman-Øerne, south of Iceland, in the littoral belt.

Distribution. At the south and west coast of Norway, in comparatively shallow water (G. O. Sars); not known from Denmark, but a specimen has been recorded from the bay at Kiel (Apstein). Furthermore taken at a good number of places at Scotland, England and Ireland (several authors), besides at Jersey (teste Norman). Tattersall has recorded it as taken in 115 fath. west of Ireland. But I am inclined to think that several of the localities recorded ought to be referred to *M. Fabricii* Kr. When T. Scott recorded *M. Kröyeri* from Northbrook Island, Franz-Joseph Land, I am tolerably sure that his specimens belong to *M. Fabricii* Kr.

21. **Munna Fabricii** Kröyer (nec G. O. Sars).

(Pl. III, figs. 5 a—5 d.)

? 1846. *Munna Fabricii* Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. XXXI, fig. 1, a—q (partim).
1847. — — Kröyer, Nat. Tidsskr., Ny Række, Vol. II, p. 380 (partim).
! 1910. — — H. J. Hansen, Vid. Meddel. Naturh. Foren. Kjøbenhavn for 1909, p. 211; Pl. III, figs. 1 a—1 e.

The description and figures in my paper quoted may be sufficient for the recognition of this species. It is instantly separated from all northern forms by the regularly oval, not pyriform or ovate, shape of the abdomen, which, besides, has no lateral processes as in *M. Kröyeri*, and at most a single sublateral spine. The uropods are very thick and distally curved and produced into a strong, acute process directed backwards; seen from below (fig. 5 a) a strong, oblong process projects beyond the oblique terminal margin, and seen from above (fig. 5 b) the end of that process is perceived close by a slender process from the end of the upper wall. — The median lamella of the male operculum (figs. 5 c—5 d) is a little more than three times as long as broad, without ventral spines; in outline it is somewhat similar to that of *M. Boeckii*, excepting its most distal part, which is less widened and quite differently shaped; the outer distal angle of each pleopod is produced into a long, slender, acute process directed backwards and somewhat outwards, and the hind margin of the pleopod is somewhat convex.

It may be added that the legs are, as usual, distinctly varying as to length and thickness, being strongly or moderately strongly built, and the posterior pairs proportionately moderately short or somewhat long.

Remarks. This characteristic species was certainly mistaken for, or confounded with, *M. Kröyeri* or *M. Boeckii* by several authors until 1910.

Occurrence. Not taken by the "Ingolf".

At West Greenland it has been gathered at two places, viz. by Th. Holm at Upernivik (Lat. 72°47' N.), 10 fath., and at Godthaab (Lat. 64°11' N.), c. 50 fath., Holbøll; as already stated, I found 9 specimens of *M. Fabricii* together with 6 specimens of *M. groenlandica*, all named *M. Fabricii*, in all probability determined by Kröyer, and originating from the last-named locality. — It is not known from East Greenland.

M. Fabricii is common at Iceland, where it has been taken by several zoologists at the following places. Off the west coast at Stykkisholmr in Brede Fjord, 30 fath.; off the north coast at Grimsey, 15 fath.; off the east coast at Skálanes, 7—8 fath., in Faskruds Fjord, 20—50 fath., at Djupivogr, 8 fath., and 9 miles off the coast, 38 fath., finally south of Iceland: Lat. 64°17' N., Long. 14°44' W., 44 fath. — Hitherto not known from the Færöes.

Distribution. At Denmark this species has been gathered in Langelandsbeltet, 15 fath. (H. J. Hansen). The Copenhagen Museum possesses it from the North Sea, Lat. 57°16' N., Long. 5°30' E., 30 fath. (taken by Capt. Ørsted) and 1 old specimen from the west coast of Norway. It has been recorded from the south coast of Novaya Zemlya, Lat. 70°20' N., Long. 56 35' E., 48 fath. (Stappers), and the specimens from Northbrook Island, Franz-Joseph Land, referred by T. Scott to *M. Kröyeri* probably belong to *M. Fabricii*. Whether *M. Brandti* Zirwas (1910), recorded from sixteen places in the North Sea, belongs to *M. Fabricii* Kr. cannot be decided with certainty, but it is highly probable. More cannot be said on the distribution, as authors certainly have confounded it with other species.

22. Munna minuta H. J. Hansen.

(Pl. III, fig. 6 a.)

1897. *Munna Fabricii* G. O. Sars, Account, II, p. 108; Pl. 45, fig. 1 (nec Kröyer).

1910. — *minuta* H. J. Hansen, Vid. Medd. Nat. Foren. Kjøbenhavn f. 1909, p. 213; Pl. III, figs. 2 a—2 c.

The description and figures published by Sars together with my notes and figures quoted may be quite sufficient for recognizing this small and thin-legged species. It may, however, be added that an examination of my large materiel has given the result, that in some specimens the abdomen — its free basal segment not counted — is about as narrow as figured by Sars and is furnished with a pair of small and slender lateral spines, while in the majority the abdomen has no lateral spines and is either as broad as in fig. 2 c in my paper quoted or shows every shape intermediate between this figure and the figures of Sars. Consequently the abdominal shield varies from being slightly longer than broad to slightly more than half as long again as broad, but it is always ovate, broadest considerably before the middle.

Finally an important specific character may be added. The median lamella of the male operculum (fig. 6 a) has several ventral spines on its proximal third; it is conspicuously broader than in any of the other species, only twice as long as broad, considerably constricted somewhat from the end, and then widening strongly to the end; each distal angle is produced into a somewhat long, spiniform, acute process directed mainly outwards; the long hind margin of each pleopod is a little sinuate and, in the main, transverve. Length of the largest females with marsupium (from West Greenland) 2·5 mm.

Occurrence. Not taken by the "Ingolf".

It must be common at West Greenland, as it has been taken by several collectors off that coast at six places, from Lat. 72°43′ N. to about Lat. 60°43′ N. The places are: Upernivik, 10 fath.; Egedesminde; Lat. 66°30′ N., Long. 54°50′ W., 40 fath.; Lat. 64°52′ N., Long. 53°10′ W., 28 fath.; Godthaab, 4—10 and 25 fath.; finally not far from Julianehaab, 22 fath. — In East Greenland it has been taken by Mag. Kruuse at Angmagsalik (Lat. 65°30′ N.) and Tasiusak (Lat. 65°37′ N.); by the IInd Amdrup Exp. at Lat. 66°15′, low water.

Near Iceland it has been taken by several zoologists at the following places. Off the west coast at Reykjavik (G. O. Sars) and in Talkna Fjord, 14 fath. Off the east coast in Vid Fjord, 8—12 fath.; in Bakka Fjord, 2—4 fath.; in Faskruds Fjord, 20—50 fath.; in Breiddals Vig, 6 fath.; at Djupivogr, 8 fath.; 9 miles of the coast, 38 fath.; finally south of Iceland at Lat. 64°17′ N., Long. 14°44′ W., 44 fath. — At the Færoes it has been secured by Dr. Th. Mortensen twice: north-west of Kalsø, 60 fath., and off Borö, 20—30 fath.

Distribution. Taken a few times in Kattegat and Skager Rak, going down to 70 fath. (H. J. Hansen); off the west coast of Norway and "along the whole Finmark coast, in moderate depths" (G. O. Sars). Recorded from Cape Flora, Franz-Joseph Land, 30 fath. (T. Scott), from the south coast of Novaya Zemlya, 48 fath. (Stappers), and from Advent Bay, Spitzbergen (G. O. Sars). Besides from the North Sea, 34 fath. (Zirwas), from a few places at the west and south coasts of England (Norman), and the west coast of Ireland, 6—7 fath. (Tattersall). — According to Harger's description of the antennulæ the animals from the east coast of New England referred by him to *M. Fabricii* cannot be this species, and as Richardson in the Monograph copied the text and figures of *M. Fabricii* G. O. Sars, but among the localities has most of those noted by Harger, the statements are of no value.

23. **Munna acanthifera** n. sp.

(Pl. III, figs. 7 a—7 h.)

Description. As to general shape of the body and length of the legs somewhat similar to *M. limicola* G. O. S. The upper surface of the body has always a number of hairs, and in some specimens the clothing is somewhat dense. — The front margin of the head armed with some very robust, horizontal spines, generally 4 (fig. 7 c), but sometimes 2, 3 (fig. 7 e) or 5 (fig. 7 a). Eyes completely wanting, but the eye-stalks are very conspicuous and much varying as to length (figs. 7 a and 7 e), being from moderately short to extremely long, always conical, acute and curved a little or somewhat forwards. — Antennulæ (figs. 7 a and 7 f) nearly as in *M. limicola*; the basal joint somewhat large, but longer than broad; second joint somewhat long and the third short; flagellum 5-jointed, with 3 of the joints long.

The thoracic segments vary much in armature. Each segment has most frequently at the dorsal median line either a pair of spines or three or four spines, either in a group (fig. 7 a) or in a transverse line (fig. 7 b); these spines are sometimes short or moderately short, sometimes long or very long. Besides, the three or four anterior segments have the lateral margins at the insertion of the coxæ furnished with spines, from one to three or four at each margin (fig. 7 a). Frequently some of the spines or most of them, especially those at the middle of the segments, are seemingly wanting, but they may have been broken off. In a male from the "Ingolf" Stat. 89 each segment has only one, but very long, dorsal spine, and a similar spine is found on the head. The coxæ have also spines, from one to four or five (figs. 7 a, 7 b and 7 e); sometimes one of these coxal spines or one of the supercoxal spines is very long. — First pair of legs normal, and similar in both sexes.

Abdomen (figs. 7 b and 7 d) oblong-ovate, about or somewhat less than half as long again as broad, with or without a single spine at each lateral margin, but somewhat more upwards a single pair, and besides two or three or, rarely, four pairs of dorsal spines; these spines vary much as to length and thickness, but the posterior dorsal pair are generally thick. The posterior margin of the abdomen is rounded; the uropods about as in *M. Boeckii*. — The median lamella of the male operculum (figs. 7 g–7 h) without ventral spines, two and a half times as long as broad, broadest near the base and tapering to somewhat beyond the middle, while its distal part has the margins nearly parallel and the end in the main truncate; the hind margin of each pleopod is slightly sinuate, and at the outer margin with a minute tooth directed backwards.

Length of a female 3·1 mm., of a male 2·8 mm.

Remarks. It is evident from the description that this species is very variable as to length and curvature of the eye-stalks, and in number and length of the spines on the body. (The specimens figured have the spines moderately strongly developed.) The specimens vary from station to station, and, besides, sometimes considerably from the same station. But it must be emphasized that the variation seems to be independent of the bottom temperature, and that it is quite impossible to separate the specimens from the cold area as another species. The antennulæ are uncommonly uniform in adult specimens, but younger specimens have only 2 long joints instead of 3 in the flagellum, and second peduncular joint is shorter than in the adults.

Especially by the curious shape of the blind eye-stalks *M. acanthifera* is instantly separated from all other arctic or European species, but it agrees in this feature with *M. truncata* Richardson (1908) from the North-West Atlantic. According to the description and figures published by the American authoress, *M. truncata* cannot be identical with *M. acanthifera*, as it differs in three features, viz.: the surface of *M. truncata* is smooth, the end of abdomen uncommonly broad and truncate, and a higher number of joints is found in the antennulæ. The antennulæ of *M. truncata* contain according to description and figure 8 joints, but the minute terminal joint has certainly been overlooked, as the eighth joint on the figure is as long as the seventh; the result is that the antennulæ contain 9 joints. Furthermore the authoress referred only 2 joints to the peduncle, but this always comprises three joints; consequently the flagellum contains 6 joints, the first and the terminal short, while the remaining four joints are longer. But I never found more than 3 longer joints in the flagellum of *M. acanthifera*.

In the marsupium of a female from Stat. 105 was found a new species of the genus *Sphæronella*, belonging to the parasitic Copepoda.

Occurrence. Taken by the "Ingolf" at eight stations in the warm and three in the cold area.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 16 spec.

— — Stat. 35: Lat. 65°16′ N., Long. 55°05° W., 362 fath., temp. 3·6°; numerous spec.

— — Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3·8°; 2 spec.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25° W., 582 fath., temp. 3·3°; 10 spec.

— — Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; ab. 28 spec.

West of Iceland: Stat. 89: Lat. 64°45′ N., Long. 27°20′ W., 310 fath., temp. 8·4°; 1 spec.

South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 1 spec.

— - — Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 7 spec.

East of Iceland: Stat. 105: Lat. 65°34′ N., Long. 7°31′ W., 762 fath., temp. ÷ 0·8°; 2 spec.

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 8 spec.

— - — Stat. 124: Lat. 67°40′ N., Long. 15°40′ W., 495 fath., temp. ÷ 0·6°; 1 spec.

Besides it has been taken by the "Thor" at a single locality.

South of Iceland: Lat. 62°11′ N., Long. 19°36′ W., 1010—1140 fath.; 3 spec.

Pleurogonium G. O. Sars.

Sars' account of this genus is excellent so far as it goes. He described three Norwegian species; in the present paper six species are mentioned, three of which are new.

It is necessary to examine the origin of the lateral thoracic processes found in the majority of the species. In *P. rubicundum* G. O. S. and *P. intermedium* n. sp. these lateral processes originate only from the coxæ of the legs and are epimeral processes, while in *P. spinosissimum* G. O. S. some of them originate, as already observed by Sars in this species, from the segments and the others from the coxæ, while in *P. pulchrum* n. sp. only the segments have processes and teeth.

The males are much smaller than the full-grown females, as second to fourth thoracic segments are much less expanded laterally, and these segments are, besides, conspicuously shorter in the males than in subadult or adult females; the general aspect of the thorax differs therefore considerably in the two sexes. Sars has not figured any male, but my fig. 9a of the male of *P. latimanum* may convey an idea of the general aspect of this sex. The first pair of thoracic legs are completely similar in both sexes. The abdomen seems frequently, but not always, to be proportionately a little broader in the male than in the female. The uropods are always dorsal, with the peduncle scarcely or not distinguishable, and the inner ramus at most about half as long as, and much thinner than, the other. The abdominal operculum in both sexes has been well figured by Sars, and in both cases affords generic characters.

Conspectus of the Species.

A. No lateral processes on the thoracic segments.

a. No epimeral processes, at most a low tubercular protuberance on the coxæ of the four anterior pairs.

α. Hand of first pair of legs oblong-oval with the lower margin arcuate; terminal margin of the preceding, the fifth, joint not longer than seventh joint with claw 1. *P. inerme* G. O. S.

β. Hand of first pair of legs with the margins subparallel to the truncate end; terminal margin of the preceding joint conspicuously longer than seventh joint with claw 2. *P. latimanum* n. sp.

b. Coxæ of at least second to fourth pairs of legs with conspicuous processes.

α. Processes on the coxæ of second to fourth pairs of legs in the female somewhat short, acute; in both sexes no processes or tubercles on the three posterior pairs of coxæ. Surface of abdomen not distinctly scaly .... 3. *P. intermedium* n. sp.

β. Processes on the coxæ of second to fourth pairs of legs in the female rather long, subcylindrical with the end obtuse; in both sexes distinct short processes or protuberances on at least fifth and sixth pairs of coxæ. Surface of abdomen of a most conspicuously scaly appearance .... 4. *P. rubicundum* G. O. S.

A. Conspicuous lateral processes on at least the four anterior segments.

a. Well developed processes on all seven pairs of coxæ; no lateral processes on the three posterior segments .... 5. *P. spinosissimum* G. O. S.

b. No processes on the coxæ; lateral processes on the three posterior segments. (Conspicuous processes in the dorsal median line of the thorax) .... 6. *P. pulchrum* n. sp.

24. Pleurogonium inerme G. O. Sars.

(Pl. III, figs. 8 a—8 b.)

1883. *Pleurogonium inerme* G. O. Sars, Forh. Vid. Selsk. i Christiania f. 1882, No. 18, p. 67; Pl. II, fig. 5.
! 1897. — — G. O. Sars, Account, II, p. 114; Pl. 48, fig. 1.

The males are smaller and especially much narrower than full-grown females. In both sexes the coxæ of the four anterior pairs of legs (fig. 8 a) have a low tubercular protuberance on the margin, while on the coxæ of the three posterior pairs at most vestiges of tubercles are found. The 3-jointed antennular flagella are scarcely as long as the sum of the two distal peduncular joints, but the length of the two distal flagellar joints varies considerably, each of them being either scarcely or considerably longer than third peduncular joint, and generally longer in the male than in the female, but not as long as in the male of *P. latimanum*.

First pair of legs (fig. 8 b) have their major distal part more slender than in *P. latimanum*, *P. intermedium* or *P. rubicundum*; fourth joint is somewhat longer than broad; sixth joint is oblong-ovate with the lower margin arcuate; seventh joint has two teeth, and the sum of this joint and its claw is not shorter than the distal breadth of fifth joint. — Surface of abdomen without distinct scaly appearance.

Length of a large female with marsupium 2 mm., of a male 1·5 mm.

Occurrence. Not taken by the "Ingolf".

It has been gathered in two places at the east coast of Iceland, viz. by Dr. A. C. Johansen in Bakka Fjord, 25—32 fath., 1 spec., and 43—52 fath., 1 spec., and by Mag. R. Hørring in Faskruds Fjord, 20—50 fath., 3 spec. — Furthermore taken by the IInd Amdrup Exped. at Jan Mayen, 50—60 fath., large number of spec.

Distribution. Taken in the Sound off Landskrona, 17—28 fath. (Björck); at Denmark in the Kattegat, $17^{1/2}$ fath., and in Skager Rak, 110 fath. (H. J. Hansen); in several places on the west coast of Norway, 60 to 150 fath. (G. O. Sars); in the North Sea (Zirwas); recorded besides from some places at both sides of Scotland (Robertson; T. Scott), off Northumberland, 25 fath. (Norman) and off the west coast of Ireland, 199 fath. (Tattersall); T. Scott recorded it from Cape Flora, Franz-Joseph Land, 30 fath.

25. **Pleurogonium latimanum** n. sp.

(Pl. III, figs. 9 a—9 d.)

Male. Closely allied to *P. inerme.* — The antennular flagella considerably longer than the sum of the two distal peduncular joints (fig. 9 b); the two distal joints in the flagella longer than in *P. inerme.* The four anterior pairs of coxæ partly with and partly without a vestige of a marginal tubercle. First pair of legs (fig. 9 c) differ considerably from those in *P. inerme*; fourth joint is much broader than long, the fifth extremely broad; sixth joint has the lower margin in the main parallel with the upper, somewhat sinuate and constituting an angle of about 100° with the nearly transverse terminal margin: seventh joint with a single process, and together with the claw somewhat shorter than the breadth of sixth joint. — Surface of abdomen not scaly.

Length of the single apparently adult male 1·0 mm.

Remarks. *P. latimanum* is distinguished from *P. inerme* mainly by the first pair of legs, which distally are broader and especially have the sixth joint quite differently shaped; it may be added that in *P. inerme* I have not found any variation worth mentioning in the shape of fourth to seventh joint of these legs. I must therefore consider *P. latimanum* to be a valid species.

Occurrence. Not taken by the "Ingolf", but by Th. Holm during the cruize of the "Fylla" in 1884, at a single place.

Davis Strait: Lat. 66°32′ N., Long. 55°34′ W., 100 fath., stones with Hydroids, 1 spec.

26. **Pleurogonium intermedium** n. sp.

(Pl. III, figs. 10 a—10 d.)

Description. Intermediate between *P. inerme* and *P. rubicundum.* It differs from *P. inerme* in having conspicuous processes on second to fourth pairs of coxæ; these processes are in the female (fig. 10 a) oblong, conical and acute, much shorter than the differently shaped processes in the female *P. rubicundum*; in the male (fig. 10 b) these processes are at least sometimes distinctly shorter than in the female and less acute; the processes of first pair of coxæ are in the female obtuse and much smaller than the three following pairs. The coxæ of the three posterior pairs of legs are without any vestige of processes, thus about as in *P. inerme.* — Antennular flagella nearly as in *P. inerme.* — First pair of legs (fig. 10 c) with fourth joint conspicuously broader than long, thus a good deal thicker than in *P. inerme*; fifth joint is also a little larger, while sixth joint and seventh joint with claw are in the main as in *P. inerme.* — Abdomen (fig. 10 d) more oblong than in the two species mentioned; its surface at most with vestiges of some scales.

Length of an ovigerous female 1·3 mm., of a male 1 mm.

Remarks. *P. intermedium* is certainly a valid species, easily separated from allied forms by the characters pointed out. Furthermore it is smaller than *P. inerme*, and is taken only in water near to or below zero and in more considerable depths.

Occurrence. The "Ingolf" has captured this species at three stations, two among them in the cold area.

North of Iceland: Stat. 128: Lat. 66°50' N., Long. 20°02' W., 194 fath., temp. 0·6°; 2 spec.

— - — Stat. 126: Lat. 67°19' N., Long. 15°52' W., 293 fath., temp. ÷ 0·5°; 3 spec.

North-West of the Færoes: Stat. 138: Lat. 63°26' N., Long. 7°56' W., 471 fath., temp. ÷ 0·6°; 40 spec.

27. Pleurogonium rubicundum G. O. Sars.

(Pl. III, figs. 11 a—11 b.)

1864. *Pleuracantha rubicunda* G. O. Sars, Forh. Vid. Selsk. i Christiania f. 1863, p. 220.

! 1897. *Pleurogonium rubicundum* G. O. Sars, Account, II, p. 113; Pl. 47, fig. 2.

Sars has published an excellent figure and a good description of the female, but some notes on both sexes must be added. — In the female the processes on the coxæ of second to fourth pairs are long, subcylindrical with the end rounded, sometimes (fig. 11 a) even longer than in the animal figured by Sars; the processes on first pair are conspicuously shorter and thicker than on the three following pairs; the coxæ of fifth to seventh pairs are adorned with small, distally rounded, conspicuous processes, generally a little broader than long, and those on seventh coxæ are smaller than the two other pairs. In the male the processes on second to fourth pairs of coxæ are obtuse, not cylindrical, broader, but scarcely longer than in the male of *P. intermedium* (comp. fig. 10 b); the processes on fifth and sixth pairs are smaller than in the female, and on seventh pair rudimentary. — As to the antennulæ and first pair of legs the figures of Sars are sufficient. — The abdomen is somewhat broad, especially in the male, and its surface, excepting on its most posterior part, has the appearance of being covered with a very large number of small, imbricate scales (fig. 11 b); in reality scales do not exist, but the scaly aspect is due to fine, sharp, impressed lines limiting small areas.

Remarks. Both sexes are easily distinguished from the preceding forms by the scaly aspect of the abdomen, and by possessing small processes on fifth and sixth pairs of coxæ; the females are besides separated by the long, subcylindrical and obtuse processes on second to fourth pairs of coxæ.

Occurrence. Not taken by the "Ingolf". But in 1899 it was captured by Dr. Th. Mortensen at the Færoes at Klaksvig, 10—15 fath., 3 spec.

Distribution. It has been recorded from Kiel in the Baltic (Apstein), from off Landskrona and further northwards in the Sound, 12—28 fath. (Björk), and in south-western Kattegat, 15 fath. (H. J. Hansen). It occurs along the whole coast of Norway from Christiania Fjord to Vadsø, 6—30 fath. (G. O. Sars); finally it has been recorded from a few places at both sides of Scotland (Norman, T. Scott), in the North Sea off the northern coast of England (Norman), and at the east and west coasts of Ireland, 6 to 37 fath. (Tattersall).

28. **Pleurogonium spinosissimum** G. O. Sars.

1866. *Pleuracantha spinosissima* G. O. Sars, Beretning om en Sommeren 1865 foretagen zool. Reise ved Kysterne af Christianias og Christianssands Stifter, p. 30.
! 1897. *Pleurogonium spinosissimum* G. O. Sars, Account, II, p. 115; Pl. 48, fig. 2.

Sars' representation of the female is very fine. The male, which he has not mentioned, is much smaller than the adult female, with second to fourth thoracic segments considerably shorter, the processes from the postero-lateral angles of second and third segments much shorter than in the female, and not as long as broad, while the fourth segment has its lateral margins without any anterior or posterior angle; all coxal processes nearly as in the female. Young females of the same size as the males agree with them as to the processes of the segments.

Length of an ovigerous female 2·5 mm., of a male from the same locality (Jan Mayen) 1·5 mm. Sars has recorded 3 mm. as the length of the adult female.

Remarks. In the marsupia of a good number of specimens from Iceland I found a species of the family Choniostomatidæ.

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

North of Iceland: Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0·6°; 1 spec.
— - — Stat. 126: Lat. 67°19′ N., Long. 15°32′ W., 293 fath., temp. ÷ 0·5°; 1 spec.

The species has never been found at Greenland, but is not uncommon at Iceland. At West Iceland it has been taken by Mag. W. Lundbeck in Ønundar Fjord, 11—12 fath., 22 spec., and Sars recorded it from Reykjavik. At the east coast of Iceland it has been gathered by Mag. R. Hørring and Dr. A. C. Johansen in Bakka Fjord, 43—52 fath., and 13—15 fath., Seydis Fjord, 5—9 fath., Nord Fjord, 40 fath., Faskruds Fjord, 20—50 fath., and Breiddals Vik, 6 fath. The IInd Amdrup Exp. secured a good number of specimens at Jan Mayen, and at the Færoes it has been collected by Dr. Th. Mortensen at Klaksvig, 10—15 fath.

Distribution. Taken at Denmark in the northern half of the Sound (W. Björck) and Store Belt, in Kattegat and Skager Rak, 16 and 110 fath. (H. J. Hansen); at the coasts of Norway from Christiania Fjord to Vardø, 60 to 100 fath. (G. O. Sars), and at Cape Flora, Franz-Joseph Land, 30 fath. (T. Scott). Finally recorded from the Firth of Clyde (Robertson) and east of Northumberland (Norman).

29. **Pleurogonium pulchrum** n. sp.

(Pl. III, figs. 12 a—12 e.)

Female (without marsupium). Surface of the head with two pairs of minute denticles in a transverse row (fig. 12 b). — First joint of the antennulæ with a small spine at the middle of the front margin and a somewhat long spiniform process a little from the end; flagellum 3-jointed, as in all preceding species. — Third joint of the antennæ with a very conspicuous, spiniform process vertical on its outer margin a little beyond the middle, and a smaller process on the opposite margin.

Each of the four anterior thoracic segments (fig. 12 a) has the lateral margins adorned with a very long, slender and acute process, and besides with two to five very much smaller processes. On first segment the large process projects from the antero-lateral angle, and behind it two or three acute denticles; on the three following segments the lateral margin is angularly bent, and the long process projects from that angle; on third and fourth segments, but not on the second, a very small process is found in front of the large process, and behind the latter process the margin has three or four small processes on second and third segments, but only two on the fourth (fig. 12 c). Fifth and sixth segments each with a very long lateral process and a very small process in front of its base, but behind it the rounded coxa is seen; seventh segment only with a rather short lateral process. — First segment has a median dorsal process, which is extremely long, somewhat thick, denticulate and directed upwards and a little backwards (a large portion of the process hast been lost in my specimen); each of the other segments, excepting the fifth, has also a median process, but the six dorsal processes decrease very much in size backwards, so that the process on sixth segment is rather short; fifth segment has a minute median denticle.

First pair of legs (fig. 12 d) robust, but deviating somewhat from those in the preceding forms; fifth joint is nearly longer than deep, with three teeth and two long articulated spines on its lower margin; sixth joint a little more than twice as long as deep; with two somewhat long spines on the prehensile margin; seventh joint with claw not much shorter than sixth joint.

Abdomen — not including its basal segment — is not much longer than broad (fig. 12 e). Each lateral margin from somewhat from the base to the uropods armed with 12 moderately long, distinctly curved, spiniform, acute processes. The end flatly rounded with a small tooth between the terminal and the lateral margin, while between this tooth and the uropod the latter margin has some minute teeth.

Length of the specimen 1·1 mm.

Remarks. *P. pulchrum* agrees with the other northern forms of *Pleurogonium* in all more important features, but it is abundantly distinguished by the numerous processes on thorax, abdomen and peduncles of antennulæ and antennæ.

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

West of Iceland: Stat. 8: Lat. 63°56′ N., Long. 24°40′ W., 136 fath., temp. 6·0°; 1 spec.

Pseudomunna n. gen.

Description. General aspect of the body nearly as in *Munna*. — Ocular protuberances low, rounded. Antennulæ (Pl. IV, fig. 1 b) with third joint of the peduncle elongate; flagellum in the male (probably also in the female) long with a good number of joints. The four proximal joints of the antennæ thicker and much longer than in *Munna* (fig. 1 a); squama minute, rounded (the remainder of the antennæ lost in my specimens). Mandibles (fig. 1 c) in the main as in *Munna*, with the molar process subcylindrical, but the palp consists of a single, somewhat long, slender joint. Maxillipeds (fig. 1 d) with all parts longer and more narrow than in *Munna*; second joint with lobe about two and a half times as long as broad; fourth and fifth joints somewhat feebly expanded, and each longer than broad; epipod lanceolate, more than twice as long as broad.

Thoracic segments and coxæ as in *Munna*. — First pair of legs (fig. 1 e) differ much from *Munna*; fifth joint nearly twice as long as the fourth or the sixth joint, with many long and robust spines on the lower side; sixth joint slightly thickened and much narrower than the fifth, about three times as long as deep, and with some shorter spines at the lower margin; seventh joint moderately robust, half as long as the sixth; claw scarcely as long as in *Munna*. (The other legs lost in my specimens).

Abdomen (figs. 1 f and 1 h) broad, but posteriorly considerably produced, and it differs much from *Munna* in the insertion of the uropods. These appendages are unfortunately lost, but they must have been very robust and probably long, as their very large insertions protrude on the upper part of the sides and partly dorsally as vaulted parts, with their cup-shaped end turning backwards, somewhat outwards and distinctly downwards. — The female operculum (fig. 1 g) is somewhat broader than long, and tapers from much before the middle to the moderately broadly rounded end. The median lamella of the male operculum somewhat reminds one of that in *Munna groenlandica*, but the end of each pleopod is much more deeply cleft, divided into an inner lobe and an outer process (figs. 1 h—1 i).

Remarks. *Pseudomunna*, which in general appearance is rather similar to *Munna*, differs sharply from this genus in the antennulæ, in the much longer proximal joints of the antennæ, in the more narrow joints of the maxillipeds, in the shape of first pair of legs, finally in having the abdomen produced posteriorly and with very large and protruding semidorsal insertions for the uropods. — In some of these characters *Pseudomunna* is allied to *Dendrotion*, and it is certainly rather closely allied to a very curious animal, the antarctic form *Mormomunna spinipes* Vanhöffen (1914), but at least the median lamella of the male operculum differs so much in the two genera that they cannot be united.

Only one species is known.

30. **Pseudomunna hystrix** n. sp.

(Pl. IV, figs. 1 a—1 i).

Description. Head nearly as in *Munna Hanseni*, but the ocular protuberances are still lower (fig. 1 a) and apparently without facets. — Antennulæ in the male (fig. 1 b) a little more than half as long as the animal; first joint somewhat inflated but yet much longer than thick; second joint somewhat shorter than the first, rather slender, with an extremely long and strong seta at the end; third joint slender and nearly twice as long as the second; the flagellum more than half as long again as the peduncle, 17-jointed, with the first joint quite short and the second very long. In the female the antennulæ were lost, excepting their two proximal joints (fig. 1 a), which differ but little from those in the male. — Third and fourth joints of the antennæ have some very strong, nearly spiniform, long setæ on the inner side near the end.

The thoracic segments somewhat remind one of those in *Munna acanthifera*, but the four anterior segments have a much stronger armature. Each of these segments has on the upper surface (fig. 1 a) a number of rather irregularly distributed protuberances shaped as cones cut off; some among these cones are small, while others are much thicker and higher, and each cone serves as the foot for a spine; most of these spines are lost or broken near the base, but two or three remain, and they are long, strong, a little curved and adorned with some small, spiniform lateral processes; at the lateral margin each of these segments has a couple of such spiniferous cones, and similar protuberances are found on the coxæ. The three posterior segments have very little armature excepting near the lateral margins, where it is developed nearly as on the anterior segments; the corresponding coxæ are armed nearly as the preceding pairs. — The thoracic legs are lost excepting the first leg in the female; this leg (fig. 1 e) has been described in the diagnosis of the genus.

Abdomen has its posterior part somewhat more produced in the male (fig. 1 h) than in the female (fig. 1 f) as an oblong lobe, in the male this lobe has a few short spines on its terminal margin, but whether such spines have existed in the female cannot be decided. The abdomen has one pair of lateral and one pair of sublateral spines, furthermore on the dorsal surface six or seven spines of varying size, and each placed on a less or more elevated foot. — The female operculum (fig. 1 g) somewhat longer than broad, with two pairs of small spines somewhat from the lateral margins. The median lamella of the male operculum (figs. 1 h—1 i) is scarcely three times as long as broad, broadest before the middle, while the subdistal part is somewhat narrower; the end of each pleopod has a deep, triangular cleft, while the major inner part forms a lobe somewhat longer than broad, which has a number of long setæ on the outer margin; the outer part is distinctly shorter than the lobe, and constitutes an oblong-triangular, acute plate directed backwards and a little outwards.

Length of the female without marsupium 3·4 mm., of the male 3·1 mm.

Remarks. This species is so characteristic, that it may be easily recognized, though the mutilated state of the specimens made the description incomplete as to several points; the worst shortcoming is that nothing can be said on the strong and probably long uropods.

Occurrence. Taken only by the "Ingolf", at a single station.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 1 spec.

Dendrotion G. O. Sars.

This very peculiar genus was established by Sars on a single species. His generic diagnosis is based exclusively on the adult female, but immature females and males have the four anterior thoracic segments much more slender (fig. 3 a). He said in the diagnosis: "the anterior part of the mesosome rather broad, and flanked by strong spines, the posterior abruptly narrowed, with linguiform produced lateral parts." But these statements are somewhat misleading and deficient. The "spines" on the four anterior segments are real long and slender processes from the segments (figs. 3 a and 3 b), and they are never acute as figured by Sars; the three posterior segments are produced in nearly cylindrical protuberances, which are very long, excepting on seventh segment, and have the legs inserted on their ends, but the coxæ of these legs are produced in processes, which are of moderate length in *D. spinosum* Sars, but in *D. paradoxum* are extremely long on fifth and sixth segments, and completely similar in appearance to the lateral processes of the four anterior segments, though they, as stated, originate not from the segments but from the coxæ.

Remarks. Fortunately I possess not only a few specimens of *D. spinosum* G. O. Sars, but, besides, a number of a still more curious species, so that a somewhat more full account of this type can be given.

31. **Dendrotion spinosum** G. O. Sars.

(Pl. IV, figs. 2 a—2 c.)

1872. *Dendrotion spinosum* G. O. Sars, Forh. Vid. Selsk. Christiania for 1871, p. 273.
! 1897. — — G. O. Sars, Account, II, p. 116; Pl. 49.

Four specimens are to hand, viz. three full-grown females, one of them with marsupium, and a probably adult male. The material, though rather mutilated, enables me to give some additions and corrections to Sars' description and figures, and, besides, to point out characters of specific value.

The processes bearing the antennulæ and antennæ are in my specimens longer than shown by Sars, being more than twice as long as broad (fig. 2 a). The antennulæ are somewhat less elongate than in the next species; the basal joint is very long, but yet, according to Sars' figure, not half as long as the last peduncular joint of the antennæ; the flagellum is 9-jointed in a full-grown female. — The antennæ have the peduncle 6-jointed, but the first joint is short and not visible from above, being overlapped by the basal part of the antennula; according to Sars' figure second peduncular joint is not fully one-third as long as the fifth; fifth and sixth joints are extremely long, the sixth longer than the fifth and somewhat longer than the flagellum, which consists of 16 joints.

The thoracic segments show features of interest. The first segment at each side feebly produced into a low antero-lateral protuberance terminating in a very long, thin process (figs. 2 a—2 b), and at the lateral part of the front margin of the segment is seen the coxa, which is produced in a rather short epimeral process (*ep*). Second to fourth segments each produced on the side in a somewhat thick protuberance somewhat less long than, or fully as long as, thick, and bearing the coxa, the anterior margin of which is visible from above at the end of the front margin of the process; just behind the coxa the thick protuberance terminates in a very long, slender process; the whole structure of the three segments is in the ovigerous female more similar to that found in the next species (shown in fig. 3 a) than to the figures of Sars, and in specimens without marsupium the structure is almost as on fig. 3 a, excepting that the lateral protuberances are a little shorter. The processes terminating the protuberances of the four anterior segments are all long, those on second and third segments longer than the others, but conspicuously shorter than the breadth of the head; furthermore they have no granules, are straight, slender, and distinctly tapering to near the end (fig. 2 b), which is slightly or a little thickened, cut off transversely, but with three or four minute or nearly obsolete teeth on the margin, and the end has a very long, strong seta (fig. 2 a); the first pair of processes have, besides, a similar seta on the upper side somewhat from the base, while the three other pairs possess the last-named seta and, besides, two or three setæ placed more proximally on the process or at the end of the protuberance. The surface of these segments is furnished with a number of similar very long setæ, each inserted on a more or less elevated small foot; first segment has only one pair of such setæ situated somewhat from the middle near the posterior margin, while second and third segments have four or five pairs placed in a row near the posterior margin and off the base of the protuberances; fourth segment has two or three pairs along the posterior margin and, besides, two pairs in a transverse line before the middle of the segment.

The three posterior segments (fig. 2 c) differ much from the others. Each is produced into a lateral pair of nearly cylindrical protuberances about as long as, or a little longer than, the breadth of the corresponding segment, and bearing the coxæ on their ends; the coxa itself is nearly as broad as the protuberance, but short and at the end produced in a slender process; the processes of fifth coxæ are shorter than the breadth of the coxæ, those of sixth pair are distinctly longer than, or even almost twice as long as, the preceding pair, and the processes of seventh pair of coxæ are still a little longer and thinner; the processes have the end cut off and a long terminal seta, while the surface of the three segments has no long setæ, but the protuberances from fifth and sixth segments have a single long dorsal seta. The processes are without granules.

The abdomen of both sexes has been well figured by Sars. The four strong, curved spines on each lower margin and the shape of the opercula are characteristic. I found it impossible to point out a separate basal segment of the abdomen.

Length of the female with marsupium 3·5 mm., of the female without marsupium 3·8 mm.; a probably adult, very mutilated male has been about 2·8 mm.

Remarks. Though my description of the thoracic segments with their protuberances and the processes differs materially from the representation given by Sars, I am sure that my specimens belong to his species, as the armature of the abdomen, the median plate of the male operculum, and an uropod preserved in a female agree completely with his figures. In the description of, and remarks on, *D. paradoxum* the differences between the two species are pointed out.

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

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 1 spec. (♂)

Furthermore the "Thor" secured it in 1904 at the following place.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 1 spec. (♀)

Distribution. The Copenhagen Museum possesses two females gathered by the "Thor" (Dr. Joh. Schmidt) in the North Sea at Lat. 58°32′ N., Long. 4°18′ E., 149 fath., thus not very far from South-Norway. Sars has recorded it from Hardanger Fjord, 150 fath.

32. Dendrotion paradoxum n. sp.

(Pl. IV, figs. 3 a—3 e).

Description. The material comprises a number of not full-grown specimens — their anterior thoracic segments consequently less expanded than in ovigerous females — and a single, perhaps adult, male; all specimens have lost the major part of their appendages. This species is allied to *D. spinosum*, but it looks still more aberrant.

The processes of the head are as long as, or shorter than, those in my specimens of *D. spinosum*. First joint of the antennulæ is extremely long; in a single specimen with an antennula and an antenna well preserved (fig. 3 c) this joint is more than two-thirds as long as sixth peduncular joint of the antennæ; the flagellum is 8-jointed in this specimen. — Antennæ with second joint longer than in *D. spinosum*, in the specimen mentioned half as long as the fifth joint, which is a little shorter than the sixth; flagellum scarcely longer than sixth peduncular joint, 8-jointed.

The four anterior thoracic segments (fig. 3 a) with the lateral protuberances a little longer than in *D. spinosum*, but their terminal processes are much longer than in that species, those of second and third segments distinctly longer than the others, and each considerably longer than the breadth of the head; each process is shaped almost as in *D. spinosum*, terminating in two to four small teeth on the truncate end (fig. 3 b), and a seta considerably shorter than in *D. spinosum* is inserted on or above near the end; each process has furthermore a long dorsal seta before the middle, and those of second to fourth segments besides a seta beyond the middle and at least sometimes one or two proximal setæ. All these processes and a distal part of the protuberances are adorned with a number of sharp granules (fig. 3 b). — These segments have very long dorsal setæ, each seta inserted on an elevated foot, but each of the three anterior segments has only a single pair, placed near the posterior margin a little from the middle (fig. 3 a), while the fourth segment has an anterior and a posterior pair, in the large male even besides two pairs near the lateral margin.

The three posterior segments have their lateral protuberances nearly longer than in *D. spinosum*; the processes on fifth pair of coxæ are slightly shorter than those on fourth segments (fig. 3 a), but a little longer than those on sixth pair, and about three times as long as the processes on seventh pair of coxæ; all these processes are granulated like the anterior pairs. Each of these segments has a single pair of dorsal long hairs.

The thoracic legs, as far as is known (fig. 3 a), seem to be somewhat longer than in *D. spinosum*; the prehensile hand (fig. 3 d) is a little more slender than in that species.

The abdomen shaped as in *D. spinosum*, generally with 3, in the large male with 4 pairs of marginal spines. The end of abdomen of one specimen has five minute teeth (fig. 3 e), but in other specimens the end has only a single tooth or two or three obsolete, irregular teeth. I have been unable to point out any difference in the shape of the opercula in either sex between this species and *D. spinosum* (uropods lost).

Length of the large male 2·6 mm., while the other specimens are smaller, most of them 2—2·5 mm.

Remarks. *D. paradoxum* is easily separated from *D. spinosum* by the thoracic processes, which are conspicuously set with a good number of granules quite wanting in the other species. Furthermore the processes of the four anterior segments are longer than in *D. spinosum*, the processes on the coxæ of fifth segment almost as long as the preceding pair of processes, while in *D. spinosum* they are quite short; in *D. paradoxum* the coxal processes decrease much in length from fifth to seventh pair, while in *D. spinosum* they increase in length backwards. The existence of a pair of setiferous tubercles on the three posterior segments is also a valuable character, and the relative length of the joints in the antennular and antennal peduncles affords other characters, when these appendages have been preserved.

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

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5; 20 spec.

It may be noted that enormous quantities of sponges were procured at that Stat. 78. Among the animals found were the specimens of *D. paradoxum*, a specimen of *D. spinosum*, furthermore the two specimens of the above-described *Pseudomunna hystrix*, specimens of the extremely long-legged *Pseudotanais longipes* H. J. H., and of *Typhlotanais eximius* H. J. H., which possesses very elongate and slender chelæ. I suppose that all these animals live on sponges, and that there may be some correlation between their armature or very elongate appendages and their mode of living.

Group IV. Schistosomatini.

It was deemed unavoidable to establish this group on a single genus (with a single species), which seems to be intermediate between other groups, and rather distant from them all. In order to avoid reiterations no characterization of the group is given, as the description of the genus together with the remarks may be sufficient.

Schistosoma n. gen.

Description. Head somewhat similar to that of *Desmosoma*; no eyes. Antennulæ moderately long (Pl. IV, fig. 4 a); the basal joint somewhat slender and very oblong. The four proximal joints of the antennæ moderately short, robust (the two distal, probably strong joints of the peduncle and the flagellum lost); squama very small. — Mandibles (fig. 4 d) somewhat slender, in the main as in the *Janira*-group; left mandible has the incisive margin somewhat long, a slender movable lobe and a few setæ; the molar process is vertical on the corpus mandibulæ, slightly tapering towards the end, which is cut off, with the end irregularly shaped and adorned with a few short setæ; palp well developed. — Maxillipeds (fig. 4 e) in the main as in *Janira*; second joint very broad; its lobe large, almost as long as the joint itself, much longer than broad, with the terminal margin very oblique and showing some triangular teeth; the palp has the first joint very broad, second joint moderately broad and longer than broad, third joint only a little more than half as broad as the second and broader than long, the two distal joints well developed; epipod somewhat small.

Thorax (fig. 4 a) divided into two sections, because the fifth segment is narrowed in front as a kind of short stalk. All segments movable. The three anterior segments laterally produced into oblong protuberances directed outwards and forwards; the fourth segment has two pairs of lateral protuberances, the first pair directed somewhat forwards, the second pair somewhat backwards; the three posterior segments each with a pair of lateral protuberances, projecting outwards on the fifth segment, a little backwards on the sixth, and much backwards on the seventh segment. All these thoracic protuberances have the terminal part moderately slender, the end cut off, and the coxæ are inserted at the base of the protuberances; the coxæ have no processes.

First pair of legs (figs. 4 a and 4 f) moderately short and very slender, scarcely prehensile, without spines; fifth joint somewhat elongate; sixth joint not thicker than the fifth; seventh joint very oblong, as long as the very slender claw; especially the terminal part of sixth joint with a number of long hairs. The six other pairs of legs somewhat long, slender, subsimilar; fifth and sixth joints rather long, with very few, nearly setiform, short spines; seventh joint (fig. 4 h) very oblong, terminating in a somewhat slender claw and a seta.

Abdomen (in the male) shows two segments; first segment is slender and somewhat long; the second is oblong-ovate, twice as broad as the first. The male operculum occupies nearly the whole lower surface of the main part of the abdomen; the median lamella tapers considerably from the base to the end. — Uropods inserted on the lateral margins rather near the end; they are somewhat short, uniramous, two-jointed.

Remarks. This new genus occupies a very isolated position. The mouth-parts are in the main as in the *Ianira*-group, the general outline of the body somewhat resembling that in *Echinopleura* (of the Desmosomatini), the first pair of legs feeble, not prehensile and without spines, the other legs nearly as in *Pleurogonium*, the male operculum uncommonly large.

Only one species is known.

33. **Schistosoma ramosum** n. sp.

(Pl. IV, figs. 4 a—4 i).

Male. Body a little more than three times as long as broad. — Antennulæ a little longer than the sum of the head and the two anterior segments; first joint (fig. 4 c) twice as long as broad and as long as second joint; flagellum a little longer than the peduncle, 8-jointed. The eight pairs of thoracic protuberances are all somewhat long, with a single small seta or two short setæ at the end; fourth pair considerably longer and thicker than the fifth. — The abdominal shield almost half as long again as broad; the posterior margin between the insertions of the uropods considerably convex. The uropods less than one-fourth as long as the last abdominal segment; first joint is short, second a little thicker and clavate, thicker beyond the middle than at the base. Each pleopod of first pair with an incision in the distal end.

Length of the single specimen 1·4 mm.

Remarks. As it was impossible as to a number of features to separate the generic from the specific characters, most of them have been mentioned in the description of the genus.

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

South of Iceland: Stat. 64: Lat. 62°06′ N., Long. 19°00′ W., 1041 fath., temp. 3·1°; 1 spec.

Group V. Ischnomesini.

Body somewhat or extremely narrow, generally most narrow at the middle, which is round. Head deeply immerged within first thoracic segment and so completely fused with it that only a more or less distinct, curved dorsal impression is seen as the limit, excepting frequently at the lateral margin, where a sharp suture is found. Eyes wanting. Antennulæ with first joint thick, nearly globular, and second joint proportionately rather long or extremely long. Antennæ without squama, long or very long. Mandibles without palp, but otherwise in the main similar to those in the *Ianira*-group, having the molar process thick, subcylindrical, transversely truncate and directed a little forwards, or being vertical on the corpus mandibulæ. — Thorax very peculiarly shaped, as fourth segment is produced somewhat or much backwards, fifth segment much to extremely much forwards, so that the distance between the insertions of the fourth and the fifth pair of legs is from very to exceedingly long; the produced parts of these segments are considerably, or very much, narrower than their leg-bearing parts. First pair of thoracic legs prehensile, similar in both sexes; fifth joint with two or three spines; the six other pairs slender, moderately or very long; fourth and fifth pairs subequal in length, and conspicuously longer than second and seventh pairs; the coxa without any process, seventh joint thin, claw short, frequently scarcely marked off. — Uropods inserted on the margin, at most moderately long, frequently reduced, small.

Remarks. This group is difficult to arrange among the other types of the family, but I insert it here as being the last of the groups with the molar process belonging to the *Janira*-type. The group is not only deviating from other Parasellidæ, but its genera show most interesting differences. As all hitherto known species, excepting one, have been somewhat imperfectly studied, it may be useful to give a more detailed account.

In 1866 G. O. Sars established the genus *Ischnosoma* on a very peculiar form, of which he later gave a full representation in the Account. Later another species was established by Sars, a third species by Tattersall, and four species from the "Challenger" by Beddard. In 1908 Harriet Richardson pointed out that the excellent generic name was preoccupied (in 1829 and in 1832), and instead of it was proposed *Ischnomesus* Rich. Furthermore the authoress distributed the species hitherto referred to *Ischnosoma* into four genera, thus establishing three new genera, and described two new species. Having a comparatively enormous material of the present group, viz. *Ischnomesus bispinosus* G. O. Sars from Skager Rak and 11 species, 10 of which new, from the "Ingolf" area, I have attempted to find valid characters for the genera and new characters for the species. In reality the genera proposed by Richardson — with the possible exception of *Rhabdomesus* based on two very imperfectly known species from the "Challenger" — must be accepted as natural, but the majority of the generic characters pointed out by Richardson in the analytical key are wrong or of no value, while other characters can be pointed out.

To take a few instances. Harr. Richardson said in the key that the abdomen in *Ischnomesus bispinosus* Sars consists of a single segment; the authoress had not seen this species but had probably taken the character from Sars' figures, which in this respect are not distinct, in reality not accurate. According to my examination of a good material of *I. bispinosus* the abdomen consists of two segments, the first short but well defined in front and behind by articulations, consequently both segments movable. — Furthermore the authoress said that the genus *Haplomesus*, based on *Ischnosoma quadrispinosum* G. O. Sars, has the "abdomen composed of a single segment", while in *Heteromesus*, to which five species were referred, it consists "of two segments". These statements are misleading. Later I redescribe *Haplomesus quadrispinosus* and establish four new species in the same genus; of the five species referred by the American authoress to *Heteromesus* I have examined co-types of the two species established in her paper, and describe in the sequel four new species. And based on such rich material it can be said, that both in *Haplomesus* and *Heteromesus* the abdomen is both above and below immovably fused with seventh thoracic segment, so that only a more or less pronounced transverse furrow or impression is seen between thorax and abdomen, while a furrow between an anterior short and a posterior large abdominal segment is most frequently wanting on the major part of the dorsal surface, but is distinct towards the lateral margins. But more can be said. In *Haplomesus* the three posterior thoracic segments and abdomen are immovably coalesced, forming a single piece; in *Heteromesus* the articulation between the fifth and the sixth thoracic segment is very distinct, while sixth and seventh segments and abdomen are immovably fused; in *Ischnomesus* not only has the abdomen two movable segments, but all thoracic segments — excepting the first which is fused with the head — are free and movable.

Some other good characters between the three genera can be pointed out, but they are found in the brief descriptions of the genera later on. But it may be useful to give an analytical key to the three genera; the fourth genus, *Rhabdomesus* Rich., is still somewhat doubtful, as its two "Challenger" species were established on specimens without the anterior part of the body, and judging from the figures of their abdomen the genus must be cancelled and its species referred to *Ischnomesus*.

A. The three posterior thoracic segments movable; the abdomen consists of two movable segments. Uropods two-jointed. Third joint of the antennal peduncles moderately short, not twice as long as the fourth .... *Ischnomesus* Rich.

B. At least the two posterior thoracic segments and the abdomen immovably fused, constituting a single piece. Uropods one-jointed. Third joint of the antennal peduncles elongate, much more than twice as long as the fourth.

  a. The three posterior thoracic segments completely fused. Body slender to extremely slender. Antennulæ with third peduncular joint and the 3-jointed flagellum well developed. *Haplomesus* Rich.

  b. Only the two posterior thoracic segments and the abdomen fused, as a real articulation is found between fifth and sixth segment. Body moderately slender or proportionately robust. Antennulæ with the part beyond second joint reduced, consisting of two or three small or quite rudimentary joints .... *Heteromesus* Rich.

Ischnomesus Richardson.

Body slender or very slender. Antennulæ well developed, 6-jointed. Antennæ with third joint moderately short, not twice as long as the fourth. Maxillipeds (Pl. IV, fig. 5 c) with second joint somewhat large, its lobe at least as long as broad, and less than half as broad as the joint; the palp at least as long as second joint itself — the lobe not included — and its second and third joints are considerably expanded, conspicuously broader than the lobe mentioned. — The posterior thoracic segments movable. First pair of thoracic legs with the fifth joint much deeper than the fourth, having its proximal half much expanded, and being broadest before the middle. Abdomen consists of two movable segments; the first is very short. — Uropods two-jointed, sometimes with a quite small exopod from the end of first joint.

The "Ingolf" has secured two species, both new.

34. **Ischnomesus profundus** n. sp.

(Pl. IV, figs. 5 a—5 f).

Male. Body about six times as long as the breadth of first thoracic segment. — Antennulæ somewhat longer than the breadth of first segment; third joint half as long as second and as long as the flagellum (fig. 5 b). Third joint of the antennal peduncle about half as long again as the fourth (the following joints lost).

First thoracic segment of a somewhat quadrangular aspect, as the major part of the lateral margins are subparallel; each antero-lateral corner produced in a conspicuous, but somewhat small, process projecting horizontally forwards. The other thoracic segments without processes. Fourth segment almost as long as second and third combined; fifth segment almost half as long again as the fourth, and nearly four times as long as the breadth near its front end.

First pair of thoracic legs (fig. 5 d) robust; fifth joint somewhat curved, much thickened with a protruding, rounded part somewhat from the base, and this part set with some spines of very different length, while the lower margin between the top of the protuberance and the distal end is somewhat concave; sixth joint slightly shorter than the fifth, scarcely three times as long as deep, without spines; seventh joint with claw somewhat strong, about half as long as sixth joint. The other pairs lost excepting a few joints; second joint of fourth pair reaches slightly beyond the posterior end of its segment, while the corresponding joint of fifth pair, when directed forwards, is rather far from reaching the end of second joint of fourth pair.

Abdomen (fig. 5 e) has its first segment very short but very distinct. Second segment about one-third as long again as broad, anteriorly considerably narrower than near the end; the lateral margins are somewhat convex, scarcely concave near the postero-lateral angles, which are well defined and sharp; the posterior margin with its major part considerably convex, and feebly concave towards the angles mentioned. The ventral excavation for the reception of the pleopods (fig. 5 f) with its posterior margin long, transverse and straight, leaving a considerable area between itself and the posterior margin; the median lamella of the operculum small, tapering from somewhat from the base to the narrow end, which does not reach the posterior margin of second pair of pleopods. (Uropods lost).

Length of the specimen 4 mm.

Remarks. *I. profundus* is allied to *I. bispinosus* G. O. Sars. but is considerably longer, and differs besides in several particulars. The processes of first segment project nearly forwards, and consequently slightly diverging, while in the male *I. bispinosus* they are longer and considerably divergent (comp. Sars' Account Pl. 52). Fifth thoracic segment less elongate than in the male *I. bispinosus*; the prehensile organ of first legs is somewhat different in shape and in number, length and place of spines; the last abdominal segment differs in having sharply pronounced postero-lateral angles, etc.

Occurrence. Taken by the "Ingolf" at its deepest station.

South of Davis Strait: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 1 spec.

35. **Ischnomesus armatus** n. sp.

(Pl. IV, figs. 6 a—6 f).

Male. The body nearly seven times as long as the breadth of the first thoracic segment, measured without taking its processes into account. — Antennulæ (fig. 6 b) reaching slightly beyond the posterior margin of second thoracic segment; second joint somewhat robust, slightly more than half as long as the entire antennula, with two or three spines along the interior margin; third joint thin and only one-fourth as long as second joint; first joint of the flagellum much shorter than the second or the third. Third joint of the antennal peduncle not twice as long as fourth joint; (the two distal joints of the peduncle with flagellum lost in my specimens). — Maxillipeds (fig. 6 d) in the main as in *I. profundus*, excepting that the epipod is considerably smaller, having more than half of the outer margin concave.

Each of the four anterior thoracic segments (fig. 6 a) anteriorly at the sides produced into a pair of somewhat long, subacute processes directed forwards, considerably outwards and distinctly upwards; the anterior margin of each process is about, or scarcely, half as long as the front margin of the corresponding segment between the origin of the processes (fig. 6 b). Fifth and sixth segments each posteriorly produced into a pair of similar processes directed backwards and somewhat outwards, but not upwards; the posterior pair of these processes are conspicuously longer than any of the other pairs. Fourth segment much produced backwards, being somewhat longer than second and third segments combined; fifth segment distinctly less than half as long again as the fourth, moderately slender, slightly more than four times as long as its breadth near the front end.

First pair of thoracic legs (fig. 6 e) more slender than in *I. profundus*; fifth joint more than twice as long as deep, with a protruding angle on the lower side somewhat from the base; this angle bears a long spine, and a still longer spine is somewhat more proximal, while the major, distal part of the lower margin is distinctly concave without spines; sixth joint is somewhat shorter than the fifth, more than three times as long as deep, without spines, and twice as long as seventh joint with claw. The other legs nearly all lost excepting the proximal joints; second joint of fourth pair reaches scarcely to the end of its segment, and is rather far from reaching the end of second joint of fifth leg.

Abdomen with the first segment very short but very distinct (fig. 6 a). Second segment scarcely one-third as long again as broad, scarcely narrower at the anterior than at the posterior margin; the lateral margins are considerably convex excepting a little from the end, where they bend backwards and a little outwards (fig. 6 f); the posterior margin is somewhat convex, with the uropods at its ends. The ventral excavation occupies nearly the whole surface excepting a moderately large posterior portion, and its hind margin is very convex. — The median lamella of the operculum is very large, distinctly narrowed near the base and then gradually a little expanded, with the lateral margins subparallel from before the middle to near the broadly rounded end of each pleopod; the lateral plates of the operculum unusually narrow. — The uropods scarcely half as long as the breadth of abdomen, two-jointed, and first joint not half as long as the second; no exopod.

Length of the male 4·8 mm.

Remarks. This fine species is abundantly distinguished from all other species of the group by the number and development of thoracic spines. In the outline of the abdomen and especially in the shape and relative size of the opercular plates it differs much from the two other species of the genus. But at least at the present state of our knowledge these differences are far from sufficient for establishing a new genus on *I. armatus*.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 males.

Haplomesus Richardson.

Body slender or extremely slender. Antennulæ well developed, 6-jointed. Antennæ with third joint elongate, two and a half times or more as long as the fourth joint. Maxillipeds (fig. 1 f) with second joint extremely large, the lobe more than half as broad as the joint and much shorter than broad; the palp not two-thirds as long as second joint itself — the lobe not included — and its second and third joints of very moderate size and narrower than the lobe of second joint, though they are much expanded, each conspicuously broader than long. — The three posterior thoracic segments and abdomen immovably coalesced, constituting an extremely long, stiff part. First pair of thoracic legs with fifth joint a little less deep than the fourth, not expanded and of normal shape. — Uropods one-jointed, short.

Remarks. This pretty genus has been established on *I. quadrispinosus* G. O. Sars. The material contains this form and besides 4 new species, all deep-sea forms. Their exoskeleton is extremely brittle, and numerous specimens are therefore very mutilated. The colour of the animals generally whitish or pure white, but several of the specimens, especially females, of *H. quadrispinosus* are greyish.

36. **Haplomesus quadrispinosus** G. O. Sars.

(Pl. V, figs. 1 a—1 p).

1879. *Ischnosoma quadrispinosum* G. O. Sars, Arch. f. Math. og Naturv. Vol. IV, p. 435.
! 1885. — — G. O. Sars, North-Atl. Exp. I, p. 126; Pl. 11, figs. 26—29.

Male. Body (fig. 1 a) extremely slender, from about eight to nearly eight and a half times as long as broad across the first thoracic segment — the processes not included in the breadth. The integument of the whole body, excepting the thoracic processes, closely set with very fine, sharp granules, and at the lateral margins of the posterior part of the thorax and of the abdomen these granules are a little larger (fig. 1 h), triangular.

Antennulæ, when directed backwards, reach beyond the middle of fourth thoracic segment; second joint (fig. 1 b) is extremely long, conspicuously more than half as long again as the four distal joints combined; third joint nearly as long as the flagellum. — Antennæ very long and slender, a little shorter than the thorax; third peduncular joint long, but yet considerably shorter than second antennular joint; fifth peduncular joint subcylindrical; sixth joint very slender, but yet distinctly increasing in thickness from base to end, and a little longer than or about as long as the fifth; flagellum very thin, somewhat or considerably longer than sixth peduncular joint, with about 18—20 joints.

Thorax on first segment with a pair of lateral processes, which are very long, from a little to considerably longer than the breadth of the segment, moderately slender, tapering, acute, directed outwards, much forwards and (fig. 1 d) very considerably upwards; third segment has a pair of lateral processes half or less than half as long as the first pair and frequently directed more outwards, but otherwise rather similar. (In the later "remarks" some variation in the processes is mentioned). Fourth segment a little longer than second and third segments combined. Fifth segment is extremely elongate, even slightly more than half of the entire animal, in adult specimens nine to nearly ten times as long as broad somewhat before its middle, subcylindrical to the beginning of the short leg-bearing part, which is twice as broad as most of the segment, and slightly or somewhat narrower than the anterior segments.

First pair of legs (fig. 1 g) slender; fifth joint more than three times as long as deep, with two very long, nearly setiform spines and more distally a somewhat short, thin spine on the lower margin; sixth joint somewhat shorter and a little thinner than the fifth, with two somewhat short spines beyond the middle of the lower margin. The six other pairs of legs very long and very slender, without granulations, but with some very short and thin spines on fifth and sixth joints; second joint of fourth pair reaches, when stretched backwards, scarcely to the end of the corresponding joint of fifth pair.

Abdomen (fig. 1 h) about as long as broad or slightly longer than broad, and about as broad as the leg-bearing part of fifth thoracic segment; the major part of each lateral margin is rather convex and, besides, serrate from triangular granules; posteriorly, where this serration terminates, a low emargination is found, and the posterior margin between the uropods is moderately protruding and nearly semicircular. — The median lamella of the operculum, when seen in its natural position (fig. 1 i), tapers much from somewhat from the base to near the narrow end, but removed from the animal it is seen (fig. 1 k) that a rather broad part of more than the distal half of the lamella has been overlapped by the two lateral plates of the operculum. The copulatory process is short (fig. 1 l), not reaching the end of its pleopod. — The uropods are triangular, very short, not reaching beyond the end of abdomen.

Length of the three largest males (from Stat. 36, 38 and 116) 5 mm.

Female. Body (fig. 1 m) anteriorly much stouter than in the male, about five and a half times as long as broad across the first thoracic segment, the processes not counted. The integument as in the male. — The antennulæ (fig. 1 n) when directed backwards reaching about to the posterior margin of third segment; second joint only half as long again as the four distal joints combined. — Antennæ about as long as the thorax; sixth peduncular joint cylindrical, very slender and somewhat longer than the fifth; flagellum almost as long as the two distal peduncular joints combined, 17-jointed.

The thorax with the same two pairs of processes as the male, but the first pair are much smaller (fig. 1 n), less than half as long as the breadth of its segment, while the second pair are more than half as long as first pair. The four anterior segments are proportionately considerably broader than in the male, while the fifth segment is less elongate, five or six times as long as its shortest breadth, and with the leg-bearing terminal part considerably narrower than the three anterior segments. — The legs about as in the male.

The abdomen (fig. 1 o) conspicuously longer than broad, and narrower than the terminal part of fifth thoracic segment; its median longitudinal area is, as in the following forms of the group, broader than in the male, but in other respects the abdomen is nearly as in this sex. — The operculum (fig. 1 p) about as long as broad, with the basal margin very flatly convex, while its distal half has the margin semicircular.

Length of females with the marsupium rudimentary or wanting 4·5 mm.

Remarks. *H. quadrispinosus* is easily distinguished from the other forms of the genus by its two pairs of very conspicuous processes, and especially by the fact that the second pair are situated on the third segment, while fourth segment has no processes; besides, the shape of the abdomen is characteristic, differing much from those in the four following species. — Sars established the species on a single specimen, a scarcely full-grown female; I think that his figure shows the posterior half of the body distinctly broader than it was in his specimen.

The following list of localities shows that specimens have been gathered at three stations in the warm deep-sea area and at six stations in the cold area. In vain I have attempted to refer the specimens from the two areas to two species; it was impossible to find any character. I was unable to find any difference in length, breadth or shape of the more important parts — as thoracic processes, fifth segment, abdomen — between the fine males from Stat. 36 (1435 fath.) in the warm area and the male from Stat. 116 (371 fath.) in the cold area. The male from Stat. 113 is only 4·2 mm. long, consequently conspicuously smaller than my three adult specimens, and it differs from these in having the processes of first segment only slightly more than half as long as the breadth of the segment, the fifth segment is only seven times as long as the breadth somewhat before its middle, and its abdomen is conspicuously longer than broad; the male from Stat. 119 is 4·5 mm., and not only in length but in the features mentioned intermediate between the specimen from Stat. 113 and full-grown males measuring 5 mm. — The only specimen which shows appreciable and probably individual variation is the full-grown male from the deepest station (1870 fath.), as it (fig. 1 c) differs from the other large males in the shape of the thoracic processes, which are of normal length but conspicuously thicker and quite straight.

Occurrence. Taken by the "Ingolf" at nine stations.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 2 spec. (♀).

— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 spec. (♂).

South of Davis Strait: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 1 spec. (♂).

North of the Færoes: Stat. 139: Lat. 53°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; 2 spec. (♀).

East of Iceland: Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 5 spec.

North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1·0°; 1 spec. (♀).

— - — Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath., temp. ÷ 1·0°; 1 spec. (♂).

South of Jan Mayen: Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 5 spec.

— - — — Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 1 spec. (♂).

Distribution. A single specimen taken west of Norway: Lat. 67°56′ N., Long. 4°11′ E., 778 fath., temp. ÷ 1·4° (G. O. Sars).

37. **Haplomesus angustus** n. sp.

(Pl. V, figs. 2 a—2 e).

Young Male. Extremely slender, between ten and nine and a half times as long as the breadth of the anterior segments. The granulation on the body finer than in *H. quadrispinosus*.

Antennulæ (fig. 2 b) much shorter than in the preceding species, when stretched backwards not reaching the posterior margin of second segment. Second joint scarcely as long as the distal joints combined; third joint only about as long as the fourth, but in this young specimen the flagellum contains only two joints, as the distal joint has not yet been divided into two joints. — Antennæ lost excepting the four proximal joints of the peduncle: third joint about as in *H. quadrispinosus*, nearly as long as first thoracic segment with head.

Thorax with a pair of lateral processes on first segment and none on the others. These processes (figs. 2 a and 2 b) are very much shorter than in *H. quadrispinosus*, being of moderate length and thickness, each conspicuously less than half as long as the breadth of the segment, directed much upwards and outwards and somewhat forwards. The three following segments without any vestige of processes. Fourth segment about as in *H. quadrispinosus*. Fifth segment extremely elongate, slightly more than half as long as the entire animal, and besides extremely slender, being about fourteen times as long as broad somewhat before the middle; its widened terminal part a little narrower than second segment. Seventh segment in my specimen unusually small (fig. 2 d) and without legs (fig. 2 e); these features show that the specimen must be rather far from adult.

First pair of thoracic legs (fig. 2 c) in the main as in *H. quadrispinosus*, but fifth joint has a single very long, thin spine and two short spines, and sixth joint a single spine on the lower margin. The other legs, as far as preserved, nearly as in *H. quadrispinosus*; second joints of fourth and fifth pairs, when directed respectively backwards and forwards, do not quite reach one another.

Abdomen (figs. 2 a, 2 d and 2 e) triangular in aspect, because, having the lateral margins conspicuously sinuate, it increases somewhat irregularly in breadth from the base to the posterior margin; each postero-lateral angle is produced in a conical process directed outwards and backwards, slightly longer than the uropods, conical with the end obtuse. The posterior margin between these processes is, taken as a whole, moderately convex, but a little more than its median third protrudes further backwards and has its margin semicircular; this protruding part is the terminal portion of the rather broad longitudinal median area of the surface (fig. 2 d). — The median lamella of the operculum (fig. 2 e) is towards the base distinctly narrower than in *H. quadrispinosus*, but otherwise of the same shape. — The uropods about twice as long as in that species.

Length of the specimen described 4·8 mm.

Remarks. This extremely slender species is instantly separated from the other forms by having only a moderately large pair of processes on first segment and none on the other thoracic segments; besides, the shape of abdomen affords excellent characters, as it differs much from the other forms excepting *H. insignis*. As the specimen described has seventh pair of thoracic legs totally wanting it must be very far from adult; I suppose that really full-grown males may measure 9—12 mm. in length.

The type has been taken in the warm area. From a station in the cold area I have a male, which unfortunately is very mutilated, as two anterior segments with head are lost; this specimen is somewhat smaller, with fifth segment, as consequently might be expected, distinctly less slender, only ten times as long as its breadth before the middle, but in all other respects, especially the small seventh segment and the shape of the abdomen, this specimen agrees so completely with the type, that I must refer it to this species. As *H. quadrispinosus* has been taken some times in both areas, the occurrence of *H. angustus* is less astonishing.

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

South of Denmark Strait: Stat. 18: Lat. 61°44′ N., Long. 30°29′ W., 1135 fath., temp. 3·0°; 1 spec. (♂, type).

North of Iceland: Stat. 125: Lat. 68°08′ N., Long. 16°02′ W., 729 fath., temp. ÷ 0·8°; 1 spec. (mutilated ♂).

38. **Haplomesus insignis** n. sp.
(Pl. V, figs. 3 a—3 d).

Male. Very slender, about seven times as long as the breadth of the anterior segments. Body very finely granulated, about as in *H. angustus.*

Antennulæ somewhat long (fig. 3 b), when stretched backwards reaching beyond the posterior margin of third thoracic segment; second joint a little shorter than the head and first segment combined, and a little longer than the sum of the four distal joints; third joint conspicuously thicker and slightly longer than the flagellum. — Antennæ (fig. 3 a) somewhat more than half as long as the body; third peduncular joint conspicuously shorter than in the two preceding species, somewhat shorter than second joint of the antennulæ; fifth joint increases conspicuously in thickness from the base to somewhat from the end; sixth joint is somewhat longer than the fifth and increases somewhat in thickness from the base to the middle; flagellum about as long as sixth peduncular joint, 18-jointed, increasing distinctly in thickness from the base to the middle, and tapering then to the thin end.

The thorax has two pairs of very large, lanceolate processes (fig. 3 a) projecting respectively from first and fourth segment, while the sides of second segment (fig. 3 b) are produced in very short processes with the end obtuse. The processes of first segment are directed outwards, much forwards, and rather feebly upwards (fig. 3 b), and their tips reach a little in advance of the front end of the head; they are proportionately broad, four times as long as broad, lanceolate, subacute and somewhat depressed. The processes of fourth segment are slightly shorter than in the first pair, besides they are directed considerably less forwards, and only a little upwards. Fifth segment very elongate, but yet considerably less than half as long as the entire animal, nine times as long as its breadth somewhat before the middle; the terminal widened part is somewhat narrower than the anterior segments.

First pair of legs (fig. 3 c) agreeing as to armature with spines with those in *H. angustus*, but the three distal joints are distinctly more slender than in that species. The other six pairs mutilated or lost, but as far as can be seen they are more robust than in the two preceding species, but agree with them in the fact, that second joints of fourth and fifth pairs, when directed respectively backwards and forwards, do not quite reach one another.

Abdomen (fig. 3 a and 3 d) subtriangular in aspect, and on the whole somewhat similar to that in *H. angustus*, especially as it has similar postero-lateral processes, but it differs in having the median part of the posterior margin subangular, thus not broadly rounded, and the uropods are somewhat longer than in that species, somewhat more than twice as long as broad. — The median lamella of the operculum distally less narrow than in *H. angustus.*

Length of the specimen 4·5 mm.

Remarks. *H. insignis* is easily separated from the two preceding species by the large processes on fourth thoracic segment. In this character it agrees to some degree with *H. tenuispinis*, but in the latter species this second pair of processes are bent strongly forwards, and the abdomen is totally different.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 1 spec.

39. **Haplomesus tenuispinis** n. sp.

(Pl. V, figs. 4 a—4 f).

Immature Female. The material consists of a specimen which has lost the three posterior thoracic segments and abdomen, and of another evidently younger specimen without head and the two anterior segments. After some hesitation I considered these two badly mutilated specimens as belonging to the same species, especially because they show considerable similarity in the shape of fourth segment and its processes.

Antennulæ (figs. 4 a and 4 b) somewhat long, reaching the front end of fourth segment; second joint half as long again as the four distal joints combined; third joint only a little longer and thicker than second joint of the flagellum, which is longer than first joint. — Antennæ long and somewhat slender; third peduncular joint rather slender, and only half as long as second joint of the antennulæ; fifth joint about two and a half times as long as the third, feebly increasing in thickness from base to end; sixth joint a little longer and distinctly more slender than the fifth; flagellum a little less than twice as long as sixth peduncular joint, 16-jointed.

The thorax has a pair of moderately long processes on first segment (fig. 4 a) and a pair of distinctly longer processes on fourth segment. The processes on first segment are not quite half as long as the breadth of the segment, very slender, conical, slightly curved, acute, directed somewhat forwards, much outwards and feebly upwards. The processes on fourth segment are in the largest specimen (fig. 4 a) conspicuously longer, but not thicker, than first pair, directed horizontally a little outwards and very much forwards, reaching somewhat in advance of the front margin of third segment; in the small specimen (fig. 4 d) they are proportionately more slender and longer, reaching the front margin of second segment. Fifth segment — in the small specimen — about eight times as long as broad somewhat before the middle; while its terminal leg-bearing part is unusually feebly widened, being much narrower than third segment.

First pair of thoracic legs (fig. 4 c) in the main as in *H. quadrispinosus,* but fifth joint has only one very long, slender spine and one rather short spine, and sixth joint has a single moderately long spine. The other legs in the main as in *H. quadrispinosus*, but the distance between the ends of second joints of fourth and fifth pairs, when directed respectively backwards and forwards, is a little longer than in that species.

The abdomen (figs. 4 e and 4 f) differs much from that in any other species of the genus, excepting to a certain degree *H. modestus.* In the three preceding species it is divided by a distinct lateral constriction into a moderately short proximal part answering, of course, to the first segment in *Ischnomesus*, and a large distal part, but in *H. tenuispinis* the proximal part is not only elongate and rather little shorter than the distal part, but is even divided by a distinct constriction (fig. 4 e) into two portions, the anterior somewhat narrower and shorter than the posterior and besides, just in front of the transverse impression between them, armed with a pair of small, spiniform, sublateral processes (d) directed mainly backwards. The constrictions and dorsal transverse impressions show that the abdomen consists of two proportionately long anterior segments and the large posterior segment, all completely fused with each other and with the three posterior thoracic segments. The posterior segment is somewhat longer than broad and broadest behind, with the lateral margins somewhat feebly convex; each postero-lateral angle is produced in a small, quite low protuberance terminating in a very short spine marked off by an articulation; the posterior part of the abdomen between the uropods is produced into a rather large triangle much broader than long, and its terminal, subacute angle is about 100°. — The operculum (fig. 4 f) is slightly longer than broad, with the proximal margin very convex, while its distal margin is long and very feebly convex. — The uropods, inserted between this plate and the lateral protuberances, are more than twice as long as broad, subacute, and feebly overreaching the median triangle.

Length of the younger specimen without head and the two anterior segments 2·5 mm.; as the lost parts have probably measured 0·6 mm., the entire animal, which has the seventh pair of legs scarcely developed to full relative size, has consequently been about 3·1 mm. long. The specimen, of which only the anterior segments with head remain, has certainly measured about 4·3 mm.

Remarks. It seems to me very improbable, but yet not completely impossible, that some future zoologists possessing a good material may find that the two mutilated specimens referred here to the same species in reality belong to two different species; in that case the name *H. tenuispinis* ought to be applied to the form, of which the head and the anterior thoracic segments are described here. The species is abundantly distinguished from the other forms.

Occurrence. Taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; anterior part of a spec.

South of Davis Strait: Stat. 22: Lat. 58°10′ N., Long. 48°25′ W., 1845 fath., temp. 1·4°; 1 spec. without head, etc.

40. **Haplomesus modestus** n. sp.

(Pl. V, figs. 5 a—5 b).

Female. Only an immature, extremely mutilated specimen, without head and first thoracic segment, is to hand.

Third thoracic segment (fig. 5 a) with a pair of small, acute processes originating at the lateral margins and directed mainly forwards; second segment shows mutilated rudiments of probably similar processes; fourth segment with a pair of nearly similar processes placed dorsally near the lateral margins. Fifth segment about six and a half times as long as broad somewhat before the middle; its widened terminal part much narrower than the anterior segments.

Abdomen with the proximal part about as long as broad, considerably shorter than the posterior part or segment, divided besides by a feeble lateral constriction into two parts or segments, and marked off from last thoracic segment by a feeble constriction and dorsal impression, from the last abdominal segment by a feeble constriction. The posterior segment about as long as broad, increasing distinctly in breadth backwards, with the postero-lateral corners rectangular and each terminating in a small, thick, articulated spine (fig. 5 b). The posterior margin between the sublateral uropods about semicircular. — The operculum slightly broader than long, but otherwise nearly as in the preceding form, having the basal margin strongly convex and the posterior margin long and very feebly convex. — The uropods somewhat smaller than in *H. tenuispinis*, but showing about the same shape.

Length of the fragment described 1·8 mm.; the animal has been slightly more than 2 mm. long.

Remarks. Though the specimen described and figured is extremely mutilated, I think that the species is sufficiently characterized by the small processes on third and fourth segments and the shape of abdomen.

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

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 1 mutilated spec.

Heteromesus Richardson.

Body moderately slender or proportionately robust. Antennulæ with the part beyond second joint considerably or extremely reduced, consisting of three or two very or extremely short joints. Antennæ with third joint elongate, more than two and a half times as long as the fourth and even longer than the fifth or the sixth. Maxillipeds (Pl. VI, fig. 4 o) with second joint extremely large, and its lobe more than half as broad as the joint and much shorter than broad; the joint itself is conspicuously more than half as long again as the distinctly 5-jointed palp; second and third joints of the palp very small, the second slightly broader than long. — The articulation between fifth and sixth thoracic segment distinct, movable, while the two posterior segments and abdomen are immovably fused. First pair of thoracic legs (Pl. V, fig. 6 d; Pl. VI, fig. 4 p) with fifth joint much expanded, considerably deeper than the fourth, broadest considerably beyond the middle, with a long, strong spine a little before the distal end of the lower margin, and a similar spine at the lower angle of the long, oblique terminal margin. — Uropods one-jointed.

Remarks. The animals belonging to this genus are generally more robust than those of the preceding genera. They are greyish or brownish, frequently even somewhat dark. The species are evidently numerous, and some of them so closely allied that a careful investigation is necessary in order to separate them and make them recognizable.

Five species have been established, viz. two "Challenger" species by Beddard, one species by Tattersall, and two species by Harriet Richardson. Our material contains four species, all new.

41. Heteromesus dentatus n. sp.

(Pl. V, figs. 6 a—6 d; Pl. VI, figs. 1 a—1 c).

Female. The material comprises the four anterior thoracic segments with head and appendages of a specimen with the marsupium rudimentary, and, besides, a much younger specimen.

Body moderately slender, densely set with minute, sharp granules, some among them a little larger, spiniform. — Antennulæ about as long as the head (fig. 6 b); second joint about as long as the interval between the antennulæ, and almost four and half times as long as the remaining distal portion, which consists of three joints (fig. 6 c), the two proximal oblong and slender, the third joint an exceedingly small nodule. — Antennæ (fig. 6 b) almost twice as long as the sum of the four anterior thoracic segments with head; third joint slightly shorter than the breadth of first thoracic segment, and this joint has above near the distal end a conspicuous, oblong process directed upwards and forwards and terminating in a minute spine, and below, somewhat from the base of the joint, another somewhat longer, subcylindrical process terminating in a small spine and directed downwards and considerably forwards; sixth joint of the peduncle is somewhat longer than the fifth; the flagellum in the largest specimen even a little longer than the sum of the three distal peduncular joints, 21-jointed. — Labrum without any trace of processes from the antero-lateral angles.

First thoracic segment (fig. 6 b) above at the antero-lateral angles with a somewhat small, oblong, obtuse process having a couple of minute spines at the end; second segment with subsimilar processes and, besides, with a second pair of quite small processes above the middle of the lateral margins, and with some very small protuberances in a transverse row not far from the front margin; third segment with the antero-lateral processes short, and the second pair wanting, while some tubercles near the anterior margin are distinct; fourth segment without lateral processes, but with the dorsal tubercles. Fifth segment in a small specimen somewhat less than four and a half times as long as broad at the middle, a little longer than the remaining posterior part of the body, subcylindrical to somewhat from its terminal widened part.

First pair of thoracic legs (fig. 6 d) robust; fifth joint about half as long again as deep; each of the two long and strong distal spines has a minute seta somewhat from the end, and the long terminal margin has a short spine, a low minute plate with the end trispinose, and some exceedingly tiny spines; sixth joint is somewhat shorter than the fifth, about twice as long as broad, and its lower margin has beyond the middle a single, short, thick spine with a seta on its middle; seventh joint with claw somewhat robust, and longer than the lower margin of sixth joint. The other six pairs of legs have the second joint scabrous, as it is set with numerous minute, sharp granules. The second joint of fourth pair reaches, when directed backwards, a little beyond the end of second joint of fifth pair, when stretched forward.

The abdomen in the small specimen narrow, a little more than half as long again as broad; the part between the uropods moderately produced, with the hind margin nearly semicircular; each lateral margin has somewhat in front of the uropods a conspicuous process (as in the male, Pl. VI, fig. 1 a) directed backwards and outwards, and with the end truncate. — Operculum (fig. 1 c) conspicuously longer than broad, with the posterior margin considerably convex. — Uropods short, scarcely half as long as the breadth of the abdomen.

Length of the small female 2·5 mm., of the large specimen, judging from the length of the preserved portion, about 3·9 mm.

Male. Two specimens, one without the first segment and head, the other without head and the three anterior segments, were found.

The thoracic segments as to processes and sharp, more or less spiniform tubercles about as in the female. Fifth segment (fig. 6 a) respectively four and a half and nearly five and a half times as long as broad before the middle, a little longer than the posterior part of the body, and its major part subcylindrical.

Abdomen (Pl. V, fig. 6 a; Pl. VI, figs. 1 a and 1 b) broader than in the female, a little less or a little more than half as long again as broad; the processes on the lateral margins somewhat before their ends well developed, directed backwards and somewhat outwards and downwards; the median dorsal longitudinal area conspicuously broader than one of the lateral areas. — Operculum (fig. 1 b) a good deal longer than broad; the median lamella tapers moderately from somewhat from the base to a little from the end, and reaches beyond the end of the lateral, moderately broad plates. — Uropods only a little longer than in the female, scarcely half as long as the breadth of the abdomen.

Length of the male, judging from the parts preserved, 3·6 mm.

Remarks. *H. dentatus* is instantly distinguished by the well developed, oblique, lateral processes on the abdomen from the six species seen by me, viz. *H. spinescens* Rich., *H. granulatus* Rich., *H. Greeni* Tatt. and the three species established later on, which have no vestige of these processes. It agrees with *H. Greeni* and differs from *H. Schmidtii* and *H. frigidus* in having a terminal and a proximal pair of processes on the third joint of the antennæ; it agrees with *H. spinescens* in having the terminal process on third joint of the antennæ, but differs in having, besides, the proximal process on that joint. It is somewhat allied to *H. Thomsoni* Bedd., but in this species the end of abdomen is bifurcate.

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

South-West of Iceland: Stat. 78: Lat. 60°37' N., Long. 27°52' W., 799 fath., temp. 4·5°; 4 mutilated spec.

42. **Heteromesus longiremis** n. sp.

(Pl. VI, figs. 2 a—2 f).

Female. Only a very mutilated specimen, without head and first thoracic segment, is to hand. — Body finely granulated. Second segment (fig. 2 a) with a minute lateral tubercle and some tiny dorsal protuberances in a transverse row; third segment with similar protuberances but without lateral tubercles. Fifth segment somewhat long, four times as long as broad across its narrowest part, and conspicuously longer than the posterior part of the body; consequently the end of second joint of fourth pair of legs reaches, when directed backwards, scarcely to the end of the corresponding joint of fifth pair, when stretched forwards. — Thoracic legs somewhat long and slender, without sharp granules on second joint, but with the usual short spines on fifth and sixth joints.

Abdomen (figs. 2 a and 2 b) about one-third as long again as broad; the part between the uropods moderately produced, with the hind margin forming a portion of a circle. — Operculum (fig. 2 c) about as long as broad, with the posterior margin transverse, very long and slightly convex, excepting at the rounded lateral angles. — Uropods somewhat long, not fully half as long as the abdomen, straight, acute.

Length of the preserved part of the body 3·5 mm.

Male. The single specimen is without head and the four anterior segments. — Fifth thoracic segment (fig. 2 d) long, slightly more than six times as long as broad at the middle, and almost half as long again as the posterior part of the body. — Abdomen, as usual, broader than in the female, only somewhat longer than broad (fig. 2 e); the produced posterior part with the hind margin forming a portion of a circle; the dorsal longitudinal median area, as usual, narrower than in the female, nearly as broad as one of the lateral areas. — Operculum (fig. 2 f) distinctly broader than long, the median lamella with the proximal part broader, the distal part narrower than in *H. dentatus*, and scarcely reaching the end of the somewhat broad lateral plates; the distance between the operculum and the anal doors is considerably larger than in the males of *H. dentatus* or *H. frigidus*. — Uropods long, scarcely two-thirds as long as the abdomen.

Length of the preserved part of the body 3·7 mm.

Remarks. *H. longiremis* is easily distinguished from the two following species, and, besides, from the two North-Atlantic species described by Richardson by having in both sexes the fifth segment longer both in proportion to thickness and to length of the coalesced part of the body, and by having the female operculum proportionately broader with the hind margin long and slightly convex, and finally by the long male uropods, etc.

Occurrence. Taken by the "Ingolf" at a single very deep station in the warm area.

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1·5°; 2 very mutilated spec.

43. Heteromesus Schmidtii n. sp.

(Pl. VI, figs. 3 a—3 e).

Female (without marsupium). Body somewhat robust, not fully five times as long as the breadth of first thoracic segment, finely granulate, but only on the lateral part of the last abdominal segment and the last thoracic segment can the granules be said to be real sharp minute tubercles; the head and the thoracic segments, excepting the major portion of fifth segment, adorned on the upper surface with irregular wavy markings or impressions.

Antennulæ (fig. 3 b) nearly half as long as first thoracic segment with head; second joint distinctly shorter than the interval between the antennulæ, and it has above near the distal end a small tubercle, which on closer examination is seen to consist of three extremely short joints (fig. 3 c), the first distinctly longer than, and more than twice as broad as, the second, while the third is somewhat smaller than the second, and has on the end a somewhat short and a long robust seta. — The antennæ have the third joint conspicuously longer than the sixth, as long as first segment with head, and it has no proximal process at the lower side and no subterminal process at the rounded end (the end of the flagellum lost in my specimen). — The labrum has each antero-lateral angle produced in a small but conspicuous tooth (fig. 3 b).

First thoracic segment has each antero-lateral angle produced into a somewhat small protuberance; some few tiny tubercles are more or less distinct on the upper surface of the four anterior segments, and a similar pair are found on the lateral margins of second segment. Fifth segment sybcylindrical, with the terminal part not much expanded; it is not fully twice as long as broad at its anterior end, and considerably shorter than the posterior coalesced part of the body, but conspicuously longer than the abdomen.

First pair of thoracic legs robust; the leg preserved seems to be shaped and armed nearly as in *H. frigidus* (comp. fig. 4 p), but the fifth joint has distally below a less sharp angle, and sixth joint is very robust with at least two strong spines. The other six pairs of legs differ from those in *H. longiremis* in being distinctly shorter and less slender, and in having the second joint scabrous, set with numerous minute, sharp teeth; second joint of fourth pair, when directed backwards, reaches beyond the end of the corresponding joint of fifth pair stretched forwards.

Abdomen (fig. 3 d) about one-third as long again as broad; the part between the uropods considerably produced, with the median part of its posterior margin very feebly rounded, almost transverse. — Operculum (fig. 3 e) conspicuously longer than broad, with the posterior margin moderately long and slightly convex. — Uropods nearly straight, acute, a little less than half as long as the abdomen.

Length of the single specimen 4.2 mm.

Remarks. *H. Schmidtii* is easily separated from the female of *H. longiremis* by having fifth thoracic segment much shorter and thicker, and by a more oblong operculum; from *H. frigidus* it is instantly distinguished by having the abdomen conspicuously broader and another shape of the operculum. According to my own examination of three specimens of *H. Greeni* Tatt. kindly lent me by Dr. Tattersall, this species differs from *H. Schmidtii* in several particulars: the three distal joints of the antennulæ are several times longer than in *H. Schmidtii,* the first thoracic segment has at least frequently its antero-lateral angles produced into conspicuous conical processes directed mainly forwards, the spiniform granules on the anterior segments and on second joint of the legs are considerably longer and consequently more conspicuous than in my species, finally the inner distal angle of third antennal joint is produced into a conspicuous small process or tubercle terminating in a minute spine — a feature not observed or drawn by Tattersall — and, besides, this third joint has at the middle of the proximal half of its lower or inner margin an oblong, spiniform process directed forwards and downwards, and figured by Dr. Tattersall. Besides, I have compared co-types of *H. spinescens* Rich. and *H. granulatus* Rich. kindly lent me by the authorities of the U. S. National Museum. *H. spinescens* — the largest specimen, a female without marsupium, was 5·7 mm. long — differs from *H. Schmidtii* especially in having the end of third antennal joint produced in an acute process, while the fifth thoracic segment in the female is distinctly longer in proportion to its narrowest breadth than in *H. Schmidtii*, and nearly or fully as long as the posterior part of the body. (It may be inserted here that *H. spinescens* Rich. differs from *H. Greeni* Tatt. especially in having the distal part of the antennulæ shorter and only two-jointed, in having no proximal process on third antennal joint and the surface of the anterior segments less scabrous). The female of *H. granulatus* — ovigerous females were 3·9 and 3·3 mm. long — is easily distinguished from *H. Schmidtii* in being more clumsy, with fifth thoracic segment conspicuously shorter, only a little more than half as long again as broad across its most narrow part, and only as long as the abdomen, furthermore in having the abdomen narrower than in *H. Schmidtii* and shaped nearly as in *H. frigidus,* the uropods less than one-third as long as the abdomen, etc.

The species is named in honour of Dr. Joh. Schmidt, who, during his cruizes in the "Thor", collected a good number of the Isopoda described or enumerated in the present report.

Occurrence. Not taken by the "Ingolf". But the "Thor" has secured it at a single place in the warm area.

South of Iceland: Lat. 62°57′ N., Long. 19°58′ W., 508 fath.; 1 spec.

44. **Heteromesus frigidus** n. sp.

(Pl. VI, figs. 4 a—4 t).

Female. Body still a little more robust than in *H. Schmidtii*, only about four and a half times as long as the breadth of first thoracic segment. The surface of the body and legs as to granulation and distribution of wavy markings or impressions (fig. 4 i) on the thoracic segments nearly as in the preceding form.

Antennulæ (figs. 4 i, 4 k and 4 l) still more reduced than in *H. Schmidtii*. Second joint about half as long as head and first thoracic segment combined; at its upper distal angle is found a minute impression, in which is seen a tiny knot frequently difficult to examine; in reality this knot consists of two joints, the first (fig. 4 l, 3) more than twice as broad as high, with a couple of fine setæ on the margin, the second joint (4) exceedingly tiny, with a fine seta and a proportionately very long and strong seta on the upper surface. — The antennæ nearly reach the posterior end of fifth thoracic segment; third joint is scabrous, closely set with minute, sharp granules, it is about as long as the head or as sixth joint, its end is rounded without any process, and it has no proximal process at the lower margin; flagellum about as long as the two distal peduncular joints combined, with about 14 joints. — The labrum has each antero-lateral angle produced into a small, but conspicuous tooth.

First thoracic segment (fig. 4 i) with each antero-lateral angle produced into a more or less conspicuous triangular tooth; sometimes a minute tubercle may also be found on the side of second segment, but the four anterior segments have in this sex no transverse row of small tubercles. Fifth segment is from a little more to slightly less than twice as long as broad at its most narrow point, and somewhat shorter than the posterior part of the body, being about as long as the abdomen plus seventh thoracic segment.

First pair of thoracic legs (figs. 4 p and 4 q) robust; fifth joint only one-third as long again as deep, with the usual long and very strong spine a little before the end of the lower margin and a similar spine on the lower end of the long, oblique terminal margin; the last-named margin has, besides, (fig. 4 q) two short, very thick spines, each with a seta near the middle, and a low plate with the margin serrate; sixth joint about as long as the fifth, almost twice as long as deep, with both margins considerably convex, and the lower margin has beyond the middle a couple of short, thick spines, each with a seta at the middle; seventh joint with claw somewhat robust, as long as the lower margin of sixth joint. The other six pairs of legs nearly as in *H. Schmidtii*, with second joint scabrous; the end of second joint of fourth pair, when directed backwards, reaches somewhat beyond the end of the corresponding joint of fifth pair stretched forwards.

Abdomen (figs. 4 h and 4 r) narrow, half as long again as broad; the longitudinal median area on the surface is conspicuously broader in proportion to the lateral areas than in any other of my species; the part between the uropods is much produced, with the terminal margin very flatly convex. — Operculum (figs. 4 s and 4 t) somewhat longer than broad; its major part is circular, while a broad anterior part is produced forwards, so that the lateral margins somewhat from the base are sharply concave or rather bent inwards. — Uropods generally feebly curved, somewhat less than half as long as the abdomen.

Length of a female with marsupium 3·9 mm., of a large female without marsupium 4·8 mm.

Male. As usual, considerably more slender (fig. 4 a) than the other sex, about five and a half times as long as the breadth of first thoracic segment. — Antennulæ (fig. 4 b) with second joint conspicuously shorter than in the female; third joint (fig. 4 c, *3*) in the main as in the male, but fourth joint (*4*) much longer than in the female, longer than thick. — The antennæ have their second joint somewhat longer and considerably thicker than in the female, a little longer than head and first thoracic segment combined; flagellum with about 13 joints.

First thoracic segment has about three distinct tubercles in a transverse row (fig. 4 b), the three following segments each with a transverse row of distinct tubercles a little from the front margin. Fifth thoracic segment far from cylindrical, as it tapers from both ends towards the rather narrow median part; it is about five and a half times as long as broad, and nearly longer than the posterior part of the body.

Abdomen (figs. 4 a and 4 d) broader than in the female, scarcely one-third as long again as broad, with the posterior part distinctly less produced than in the female and evenly rounded, while the dorsal median area is scarcely as broad as one of the lateral areas. — Operculum (fig. 4 e) conspicuously longer than broad; the median lamella in its natural position tapering very moderately from somewhat from the base to near the end, which overreaches the lateral plates; these are more oblong (fig. 4 e) than in *H. longiremis* and coarsely granulate (fig. 4 g); in comparing fig. 4 f, representing the median lamella removed from the animal, with fig. 4 e, it is perceived that its lateral parts are overlapped by the lateral plates, second pair of pleopods. — Uropods (figs. 4 a and 4 d) longer than in the female, somewhat more than half as long as the abdomen.

Length 3·7 mm.

Remarks. The female of *H. frigidus* is easily separated from *H. Schmidtii* by the narrow abdomen and other minor features; it is closely allied to *H. granulatus* Rich., but in the latter species both sexes have the fifth thoracic segment considerably shorter in proportion to breadth at or before the middle, and in proportion to the remaining posterior part of the body, than is the case in *H. frigidus*.

Occurrence. Taken by the "Ingolf" at six stations, all in the cold area.

North of the Færoes: Stat. 141: Lat. 63°22′ N., Long. 6°58′ W., 679 fath., temp. ÷ 0·6°; ab. 20 spec.
— - - — Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; ab. 20 spec.
East of Iceland: Stat. 105: Lat. 65°34′ N., Long. 7°31′ W., 762 fath., temp. ÷ 0·8°; 1 spec.
— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 2 spec.
— - — Stat. 101: Lat. 66°23′ N., Long. 12°05′ W., 537 fath., temp. ÷ 0·7°; 1 spec.
North of Iceland: Stat. 124: Lat. 67°40′ N., Long. 15°40′ W., 495 fath., temp. ÷ 0·6°; 11 spec.

Group VI. Pseudomesini.

This group is established on a single genus (with a single species), which in general aspect is somewhat similar to the Ischnomesini, but differs from it in some important characters, and on the whole differs much from all genera of the familly. It may be sufficient here to refer to the following description of, and remarks on, the genus.

Pseudomesus n. gen.

Description (the male unknown). Body (Pl. VI, figs. 5a—5b) elongate, slender, round, narrowed at the middle about as in *Heteromesus*; the integument is somewhat weak. — Head free, somewhat ovate, narrowing forwards. Eyes absent.

Antennulæ short (Pl. VI, figs. 5a and 5c); first joint thick, second joint longer than the first; flagellum very short. Antennæ lost in the specimens excepting the three proximal joints, which are somewhat slender; third joint nearly as long as the two others combined; squama not discoverable. — Mandibles (fig. 5d) in the main as in *Macrostylis*: left mandible with the few teeth on the incisive part thick, the movable lobe short and thick; the setæ few in number, but the anterior setæ thick and distally ramified; the molar process is short, nearly lamellar, distally very narrow, directed much backwards and terminating in some setæ; palp absent. Maxillipeds (fig. 5e) nearly as in *Nannoniscus*; second joint long and moderately broad, twice as long as broad without counting the lobe, which is of very moderate size, longer than broad and at the inner margin terminating in a triangular process; the palp has its three proximal joints moderately broad, fourth joint well developed, about as long as the third, fifth joint somewhat small; epipod long, reaching the middle of third joint of the palp, but almost three times as long as broad.

Thoracic segments movable, without lateral protuberances. The three anterior segments somewhat short, the second a little broader than the first or the third; fourth distinctly narrower than the third, posteriorly somewhat produced and narrowed as in *Heteromesus*; fifth segment elongate, much produced and somewhat narrowed forwards; sixth segment much shorter and posteriorly slightly broader than the fifth; seventh segment a little broader and somewhat shorter than the sixth. — Thoracic legs slender and somewhat long, not differing much in length; first pair are a little shorter than the second, but agreeing with them and differing from the other pairs in having the fifth joint a little thicker than the third (fig. 5f) and armed with a few spines on the lower margin, and their sixth joint is a little thicker than in the following pairs; in all pairs the seventh joint is moderately long and slender, the claw almost setiform; the posterior pairs decrease perceptibly in length from fifth to seventh pair.

Abdomen distinctly broader than seventh thoracic segment (fig. 5b), nearly oval, posteriorly broadly rounded; a first free segment rudimentary. — The female operculum (fig. 5g) leaves a moderately broad lateral part and a rather broad posterior part of the lower surface uncovered. — Uropods small but thick, two-jointed, situated on the ventral side at the antero-lateral margins of the anal doors a little behind the operculum.

Remarks. *Pseudomesus* shows considerable similarity to *Heteromesus* in fourth and fifth thoracic segments, but it differs very much from the Ischnomesini in having the head free, not immerged within or fused with first thoracic segment, in the structure of the mandibles, which show much similarity to those in *Macrostylis*, *Nannoniscus* and *Desmosoma*, furthermore in having the two anterior pairs of legs subsimilar, in the place of the uropods, etc. *Pseudomesus* is perhaps more allied to *Nannoniscus* than to any other genus, but yet differs in important features.

Only a single species is known.

45. **Pseudomesus brevicornis** n. sp.

(Pl. IV, figs. 5 a—5 g).

Female. Body scarcely six times as long as broad; second segment and abdomen subequal in breadth and broader than the other parts. — Head, seen from above (fig. 5 b), a little longer than broad; seen from the side very deep (fig. 5 a). — The antennulæ occupy a lateral position and consist of five joints (fig. 5 c); second joint considerably longer than the three distal joints combined, and with a couple of long terminal setæ; third joint a little longer than the fourth, while the fifth is very small with two long setæ.

The thoracic legs show some particulars not mentioned above. First pair have three spines on the lower margin of fifth joint, each spine with a seta somewhat from the end, and in the intervals between the spines a long, low and thin lamella with numerous tiny hairs on the margin (fig. 5 f, *a*); a similar lamella is also found on fourth joint; sixth joint without spines. Second pair have four spines and the same number of lamellæ on fifth joint, two spines on the sixth joint. (Third pair wanting). Fourth pair with a single spine on fifth joint, three spines and two lamellæ on the sixth. The three posterior pairs have a peculiar, slender, triangular process on the posterior margin of third joint rather near the base, and a single conspicuous seta on the lower side of fifth joint a little from the end.

Abdomen somewhat longer than the two posterior thoracic segments combined, somewhat longer than broad and rather highly vaulted. — Operculum (fig. 5 g) somewhat longer than broad, with a short proximal part much vaulted (fig. 5 a); the posterior half has the margin nearly semicircular. — The uropods as mentioned above; first joint thicker and much longer than the second.

Length of two females with marsupium 3·2 and 2·8 mm.

Remarks. As only a single species is known, some of the minor features mentioned in the description of the genus may be only of specific value. Unfortunately the male is unknown. — *P. brevicornis* differs very much from all other forms of Asellota hitherto known; it may be said to have some similarity in general aspect to *Thambema amicorum* Stebb., but differs in mouth-parts, thoracic segments, legs, etc.

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

North of Iceland: Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 2½ spec.

Group VII. Macrostylini.

Founded on a single very peculiar genus. In order to avoid reiteration it may suffice to refer to the following treatment of the genus.

Macrostylis G. O. Sars.

Sars has published a useful diagnosis of this most characteristic genus in his standard work; he had, however, only a single species, *M. spinifera* G. O. Sars, but in the appendix he added a second species, *M. (Vana) longiremis* Mein. A third species, *M. latifrons* Bedd., was secured by the "Challenger" in the North Pacific. But the genus is evidently rather rich, as I have six species, four among them new, from the "Ingolf" area, and, besides, fragments of a seventh form. The new forms agree in most of the features pointed out by Sars as being of generic value with his *M. spinifera*, but a couple of characters, viz. his statement on the female operculum and on the uropods, must be dropped, while some other features can be pointed out. An examination of the structure with special reference to generic characters may be of some interest.

The body is somewhat or considerably elongate, to some extent similar in all species. Head movable. Eyes wanting. Antennulæ short, at most 5-jointed, in the males with more sensory filaments and, besides, sometimes thicker than in the female. Antennæ with 5 free joints in the peduncle, while the basal joint is very short and frequently scarcely distinguishable; squama seems to be wanting. The mouth-parts are well figured by Sars; the mandibles have the incisive part, the movable lacinia, and the setæ well developed, the molar process strongly tapering to the narrow, obtuse, setiferous end and directed considerably backwards; palp wanting. Maxillipeds (Pl. VII, fig. 4 c, and Sars, Pl. 51) with second joint long and more than twice as long as broad, with its lobe oblong; palp with second joint broad and long, third joint broad and short, the two distal joints short or nearly rudimentary; epipod very long.

The three anterior thoracic segments constitute together a separate subquadrangular section, with each lateral margin forming a nearly uninterrupted, distinctly convex line; these segments are dorsally well marked off, but yet scarcely, or at most slightly, movable; the four posterior segments are quite different, each very movable, but the articulation between seventh segment and abdomen seems to be slightly movable in some forms.

The legs have been well figured and described by Sars; the basal joint of most pairs is distinct, but without any process; the three anterior pairs increase somewhat in length and very conspicuously in thickness and number of spines from first to third pair, the last-named pair having third and fourth joints somewhat or considerably expanded and seeming to be "fossorial in character"; fourth pair are considerably shorter and thinner than third or second pair, and adapted for walking; from fourth to sixth or seventh pair the legs increase much in length; second joint of seventh pair has a row of probably natatory setæ along a part of the posterior margin of both margins (Pl. VII, fig. 3 e).

The abdomen is more or less oblong-quadrangular, with the posterior margin convex and the uropods inserted on the outer angles; a tergite of a basal segment was not found, but its sternite is distinct in some species. When the abdomen is examined from above, and is not too opaque, a peculiar organ is seen shining through the integument (Pl. VII, figs. 1 c, 3 f and 4 f; Pl. VI, fig. 6 c) near the lateral margin somewhat before its end; each organ is a cavity narrowing backwards as a duct, which seems to open at the inward angle of the uropod; the central part of the cavity is filled with a lump of minute rounded or angular crystals. — On the lower side of the abdomen the operculum terminates at least a little, and frequently far, from its end, but the excavation containing the pleopods is continued behind these to the end as a channel (Pl. VI, fig. 6 a; Pl. VII, figs. 2 g, 2 h, 6 g), and on its bottom the two doors closing the anal aperture are generally seen. The female operculum is oblong (though never so narrow as figured by Sars; its shape affords specific characters). — Uropods uniramous, long to extremely long, with two or many joints.

Remarks. In the shape of the mouth-parts *Macrostylis* is allied to *Nannoniscus* G. O. S., but in other features, especially the thoracic segments and their legs, it occupies an isolated position. The above-mentioned organs in the abdomen are unknown in other Asellota; they are evidently a kind of statocysts to a certain extent analogous with the organs, or unpaired organ (see later on), in the telson of at least some forms of the family Anthuridæ, and with the organs in the uropods of the family Mysidæ.

46. **Macrostylis spinifera** G. O. Sars.

(Pl. VI, figs. 6 a—6 c; Pl. VII, figs. 1 a—1 c).

1864. *Macrostylis spinifera* G. O. Sars, Forh. Vid. Selsk. Christiania f. 1863, p. 219.
! 1897. — — G. O. Sars, Account, II, p. 121; Pl. 51.

The specimen from the "Ingolf" Stat. 32 is normal and agrees with a number of specimens from Skager Rak, but the specimen from Stat. 80 differs in a couple of features. We may begin with remarks on the typical form, thus a kind of supplement to the description and figures of Sars.

The antennulæ are 5-jointed, in the female slender with the fifth joint minute (fig. 1 a). Sars says that they are 4-jointed, which is incorrect; according to two of his figures the antennulæ in the male are similar to those in the female excepting that they have three sensory filaments, while the female has two. But in a male from Skager Rak the antennulæ are considerably longer and thicker than in the female, and fourth joint has four sensory filaments, while on the fifth, which is about as long as fourth and third joints combined, five such filaments were found; in another male from the last-named locality the antennulæ are intermediate between those in the male mentioned and a normal female. — The antennæ vary somewhat in length, in two ovigerous females the antennæ do not respectively reach to the posterior margin of third thoracic segment and to the middle of fourth segment, in both cases the penultimate joint of the peduncle is only a little longer than the terminal; the long antennæ have 7, the others only 5, joints in the flagellum.

Fourth thoracic segment has each postero-lateral angle a little produced as a foot for a somewhat small, robust spine; the three posterior segments have the postero-lateral parts somewhat produced backwards and a little outwards, each bearing the leg below at the end, and on the angle a somewhat small spine; Sars' figures of male and female show the spines too thick and the majority not marked off, so that they afford the erroneous impression — not contradicted in his text — of being strong processes. — In the full-grown female without marsupium each thoracic segment has a ventral, spiniform process, which is long or very long on the two posterior segments, while the process on first sternite is moderately large, originating from the middle of the sternite and directed downwards and somewhat forwards; in females with marsupium the processes on the two posterior segments are as large as in females without marsupium, but the process on first sternite is small, and those on the four other sternites wanting. The sternites in the male armed about as in females without marsupium. — The dorsal spine on third joint of third pair of legs is, as figured by Sars, strong and very curved.

Abdomen conspicuously more than half as long again as broad, in the male slightly or not longer than the two preceding segments combined, in the female as long as these two segments and half of fifth segment combined. — The operculum reaches in the female (fig. 6 b) to rather near the end of the abdomen, thus overlapping the anal doors; it is slightly more than twice as long as broad — thus conspicuously broader than drawn by Sars — and its distal end is broadly rounded. In the male the operculum (fig. 6 a) terminates far from the end, and even before a line between the insertion of the uropods, thus leaving a long ventral channel uncovered, and in the anterior half of this channel the large anal doors are seen.

Length of adult females from Skager Rak 2·2 mm., of males 2 mm.

The somewhat aberrant specimen from Stat. 80 is a scarcely full-grown female, 2 mm. long. The antennæ reach nearly the middle of fourth thoracic segment; the penultimate joint (fig. 1 a) of the peduncle is one-third as long again as the terminal, thus proportionately longer than in the typical form; flagellum 7-jointed. The dorsal spine on third joint of third pair of legs is quite straight (fig. 1 b), and scarcely as strong as in the typical form. The abdomen (fig. 1 c) is distinctly less than half as long again as broad, its lateral margins being more convex than in the typical form. But being unable to find any further difference between this specimen and the Danish specimens I consider it to be an individual or local variety.

Remarks. *M. spinifera* differs sharply from the other species, excepting *M. abyssicola* and *M. elongata*, in having the posterior part of the abdomen strongly produced as a long and distally broadly rounded lobe between the uropods. From *M. abyssicola* it differs in having the antennulæ twice as long, the produced end of the abdomen much broader, the female operculum long, etc. *M. elongata* differs from *M. spinifera* in the extremely long, many jointed uropods, the antennæ only as long as the head, with the distal peduncular joints short, etc.

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

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 1 spec. (♂).

South-West of Iceland: Stat. 80: Lat. 61°02′ N., Long. 29°32′ W., 935 fath., temp. 4·0°; 1 spec. (♀).

Distribution. In Christiania Fjord, 15—20 fath., and in places at the west coast of Norway northwards to Lofoten (G. O. Sars); besides off the Skaw in Skager Rak, 125 fath. (H. J. Hansen). Finally fifty miles south-east of Fair Island (Shetland), 65 fath. (T. Scott).

47. **Macrostylis abyssicola** n. sp.

(Pl. VII, figs. 2 a—2 h).

Description. Body of the female somewhat more than three and a half times, that of the male four and a half times, as long as broad; in general aspect similar to *M. spinifera*. — The antennulæ are very short, 3-jointed, with first joint nearly longer than the two other joints combined; in the female (fig. 2 b) the first joint is somewhat thick, the third minute, with a long sensory filament (*s*); in the male (fig. 2 d) the antennulæ are much thicker than in the other sex, the first joint very thick, the two others with about six sensory filaments (*s*). — The antennæ are somewhat short (figs. 2 a and 2 c), reaching scarcely or about to the antero-lateral angles of third thoracic segment; penultimate joint of the peduncle conspicuously longer than the terminal; flagellum in the female (fig. 2 b) 4 or 5-jointed and conspicuously less than half as long as the peduncle, in the male 5-jointed and about half as long as the peduncle. — Distal joints of the maxillipeds nearly as in *M. spinifera* (comp. Sars, Pl. 51).

The thoracic segments decrease nearly gradually in breadth from the third to the seventh; the latter is about twice as broad as long; fourth about as long as or a little longer than the fifth, in the female twice, in the male somewhat less than twice, as broad as long. The postero-lateral angles of fourth to sixth segments subrectangular or feebly produced; the posterior angles of these and of seventh segment bear a minute spine. The ventral side of the three anterior segments is strongly carinate in the median line; the keel of first segment is produced forwards as a long, almost horizontal process projecting beyond the base of the maxillipeds; the keel of second and third segments without any process. The four posterior segments with a median ventral keel, which is somewhat feeble on fourth and fifth segments, but more developed on sixth and seventh; the keel of each of these four segments terminates at both ends without any process.

The thoracic legs in the main as in *M. spinifera*. Third pair (fig. 2 e) have the dorsal spine on third joint somewhat short and straight, the setæ on the upper margin of fourth and fifth joints unusually long, not bifid at the end. Sixth pair (fig. 2 f) slightly longer than the seventh; sixth joint about two-thirds as long as the fifth and scarcely longer than the fourth; seventh joint considerably less than half as long as the sixth and scarcely as long as the claw.

Abdomen in both sexes only a little shorter than the sum of the three posterior thoracic segments, in the female (fig. 2 a) not fully half as long again as broad, somewhat broader before the middle than at the insertions of the uropods, in the male distinctly more than half as long again as broad, with the lateral margins nearly parallel (fig. 2 c); in both sexes the posterior part between the uropods is considerably produced backwards, with each half of the margin slightly concave and the end narrowly rounded. In both sexes the ventral excavation (figs. 2 g and 2 h) is uncommonly narrow, leaving a comparatively broad area between itself and the lateral margin. — The female operculum (fig. 2 g) is unusually small and short, terminating somewhat before the insertion of the uropods, oblong-ovate, a little more than half as long again as broad, while the anal doors are situated midway between the operculum and the end of abdomen. In the male (fig. 2 h) the operculum terminates considerably before the insertion of the uropods, occupying only three-fifths of the length of the excavation; the anal doors are nearer to the end of abdomen than to the operculum. — The uropods are two-jointed; in both sexes the first joint is about as long as the sum of the abdomen and last thoracic segment, straight, robust and tapering to the obliquely produced end (fig. 2 h); in a single male the second joint has been preserved, and this joint, which is scarcely one-fourth as long as the first, is inserted behind the oblique process and terminates in a few setæ.

Length of a female without marsupium 3·1 mm., of a female with marsupium 3 mm., of a male 2·4 mm.

Remarks. *M. abyssicola* is easily separated from *M. spinifera* by 3-jointed antennulæ, considerably shorter antennæ, the long subhorizontal ventral process from first thoracic segment, while the other segments have only a carina but no processes, by the shape of the terminal part of the abdomen, the small and short female operculum, etc.

Occurrence. Taken by the "Ingolf" at three very deep stations in the warm area.

Davis Strait: Stat. 37: Lat. 60°17' N., Long. 54°05' W., 1715 fath., temp. 1·4°; 3 spec.

South of Davis Strait: Stat. 38: Lat. 59°12' N., Long. 51°05' W., 1870 fath., temp. 1·3°; ab. 10 spec.

— - — — Stat. 22: Lat. 58°10' N., Long. 48°25' W., 1845 fath., temp. 1·4°; 6 spec.

48. **Macrostylis elongata** n. sp.

(Pl. VII, figs. 3 a—3 g).

Female (without marsupium). Slender, not fully five times as long as broad. — Head distinctly larger and especially longer in proportion to the anterior thoracic segments than in the preceding forms. — Antennulæ moderately short, slender, 3-jointed (fig. 3 b); all three joints subequal in length, and the terminal joint with a somewhat broad sensory filament (*s*). — Antennæ very short, shorter than the length of the head (fig. 3 b); penultimate joint of the peduncle distinctly shorter than the terminal joint; flagellum of the left antennula in my single specimen 4-jointed, that of the right 2-jointed. — Distal joints of the maxillipeds nearly as in *M. spinifera*.

The thorax differs in outline (fig. 3 a) considerably from that in any of the other species, because its fourth segment is much narrower than the third, the fifth segment somewhat elongate, longer and broader than the fourth, and the sixth segment a little longer than in the two preceding species; the three posterior segments are a little produced at the postero-lateral angles, and each protuberance is somewhat broadly rounded (fig. 3 f), with a small spine. First thoracic sternite at the middle with a median long and strong process directed forwards and downwards; each of the two following sternites with a much smaller process; fifth and sixth sternites each with a small process directed downwards and backwards, but on fourth and seventh sternites no process was found in the specimen.

The thoracic legs (figs. 3 c—3 e), especially the posterior pairs, more slender than in the preceding forms. Third pair (fig. 3 c) with third joint more than twice as long as broad, and its dorsal spine somewhat short, but strong and a little curved; the upper setæ on fourth and fifth joints, excepting the most proximal setæ on fourth joint, very strong, spiniform, moderately long and conspicuously bifid at the end. The two posterior pairs (figs. 3 d and 3 e) subequal in length, very slender; sixth pair has the sixth joint more than half as long again as the fourth, seventh joint very long, about as long as fourth joint and a little longer than the thin claw; seventh pair has setæ, probably natatory, along both margins of second joint (fig. 3 e).

Abdomen seen from above (figs. 3 a and 3 f) slightly longer than the sum of the posterior segments, a little narrower than in *M. spinifera*, but otherwise nearly of the same shape, having the posterior part produced as a long, moderately broad lobe, and each half of the posterior margin inside the base of the uropod rather concave, while the end is moderately broadly rounded. — Seen from below (fig. 3 g), the operculum is large, occupying the major part of the lower surface, almost twice as long as broad, tapering much from before the middle to the moderately narrow, rounded end placed between the anterior ends of the insertions of the uropods, thus leaving a moderate part of the ventral excavation uncovered; the anal doors placed near the end of the abdomen. — Both uropods are mutilated; of the right uropod only the basal joint, which is slightly longer than the breadth of abdomen and moderately strong, has been preserved; the left uropod (fig. 3 a) is extremely long, not much less than three-fourths as long as the animal, though its terminal part has been lost; the portion beyond the basal joint is many-jointed and extremely thin, excepting its first joint, which is a little thicker and much longer than the others, and each of these joints has at the end a fine, but distinct hair.

Length of the specimen 2·5 mm.

Remarks. *M. elongata* differs from the forms described above in the shape of the body, very short antennæ, some features in the legs, and the extremely long uropods. From the three following species it is instantly distinguished in having the abdomen much produced backwards behind the uropods, and by various other features.

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

South of Iceland: Stat. 40: Lat. 62°00' N., Long. 21°36' W., 845 fath., temp. 3·3°; 1 spec.

49. **Macrostylis subinermis** n. sp.

(Pl. VII, figs. 4 a—4 h).

Female. Body about four times as long as broad, and, as to general aspect, in the main as in *M. longiremis* Mein. — Head somewhat long (fig. 4 a). — Antennulæ moderately short, 5-jointed (fig. 4 b); first joint longer than the two following joints combined and more than twice as long as thick; fifth joint small and thin, with a single sensory filament. — Antennæ not fully reaching the posterior angles of third thoracic segment; penultimate joint of the peduncle (fig. 4 b) long, and considerably longer than the terminal joint; flagellum about as long as the peduncle, 8-jointed. — Maxillipeds (fig. 4 c) with the two distal joints considerably larger than in *M. spinifera*.

Thoracic segments (fig. 4 a) of the usual shape; fourth segment only a little narrower than the third, somewhat broader than the fifth, and nearly more than two and a half times as broad as long; seventh segment nearly as broad as the sixth and twice as broad as long; each of the three posterior segments have their postero-lateral parts a little produced, with a small spine on the angle (figs. 4 a and 4 f). The first sternite has a small or minute process; the three following sternites are unarmed in specimens without marsupium, while the three — in ovigerous females only the two — posterior sternites have a small process, which sometimes has disappeared.

The thoracic legs somewhat similar to those in *M. longiremis* Mein., but more slender. Third pair (fig. 4 d) with the upper spine on third joint straight; most of the setæ on the two following joints somewhat long, robust, partly spiniform, but the branch near the end feeble or wanting. Sixth pair (fig. 4 e) with fourth joint only half as long as the fifth, but almost as long as the sixth; seventh joint considerably less than half as long as the sixth, about as long as the claw. Seventh pair about as long as the sixth; second joint with a close row of setæ along the posterior margin and a smaller number of setæ along the opposite margin.

Abdomen slightly longer than the two posterior thoracic segments combined, somewhat or considerably broader near the base than just in front of the uropods (fig. 4 f), from considerably less to a little more than half as long again as broad (fig. 4 g), with the major part of the lateral margins distinctly convex; posteriorly the abdomen is very moderately produced and broadly rounded, with each half of the posterior margin slightly or scarcely concave towards the uropods. The operculum (fig. 4 g) is moderately large, twice or slightly more than twice as long as broad, posteriorly moderately narrow and rounded, and reaching scarcely to the insertion of the uropods; the anal doors unusually short, yet occupying most of the rather short part of the ventral excavation behind the operculum. — The uropods (fig. 4 f) a little more than half as long as the abdomen, somewhat slender, two-jointed, with first joint from twice as long as the second to only somewhat longer.

Length of two females with marsupium 3·2 mm. and 2·9 mm.

Remarks. *M. subinermis* is sharply distinguished from the three preceding species by having the abdomen rather feebly produced posteriorly, and by the uropods, etc. It is allied and similar to *M. longiremis* Mein., but its uropods are shorter, the ventral armature on the thorax is feebly developed, while in *M. longiremis* the ventral processes on first segment and especially those on the posterior segments are long and slender; the posterior end of the female operculum is conspicuously narrower than in *M. longiremis*, and appreciable differences are also found in third pair of legs and their setæ.

In a young female with seventh pair of legs only half developed, the uropods, especially their first joint, are shorter (fig. 4 h) than in the adults. — The single male found (from Stat. 139) is scarcely adult and has the operculum very mutilated; it differs from the females in having the ventral thoracic processes conspicuously longer, the abdomen about half as long again as the uropods, and these uropods, which consequently are proportionately longer than in the females, have the first joint slightly more than twice as long as the second; in other respects this male does not show any differences worth mentioning from the female.

Occurrence. Taken by the "Ingolf" at five stations, all in the cold area.

North of the Færoes: Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; 2 spec.

East of Iceland: Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 1 spec.

— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 10 spec.

North-East of Iceland: Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath.; temp. ÷ 1·0°; 2 spec.

North of Iceland: Stat. 125: Lat. 68°08′ N., Long. 16°02′ W., 729 fath.; temp. ÷ 0·8°; 2 spec.

Besides, it has been taken by the "Thor" at the following place in the cold area.

East of Iceland: Lat. 66°19′ N., 10°45′ W., 765 fath., temp. ÷ 0·92°; 1 spec. (young ♀).

50. **Macrostylis longiremis** Meinert.
(Pl. VII, fig. 5 a).

1890. *Vana longiremis* Meinert, "Hauchs" Togter, p. 195; Pl. II, figs. 63—73.

! 1899. *Macrostylis longiremis* G. O. Sars, Account, II, p. 250; Suppl. Pl. II, fig. 1.

Sars has published good figures of the animal from above, of antennulæ, antennæ, maxillipeds and several legs. As already stated in my remarks on *M. subinermis*, the processes on first sternite and especially on the posterior sternites are long and slender in *M. longiremis*; the female operculum, which is from somewhat less than to fully twice as long as broad, reaches to the insertion of the uropods, thus to rather near the end of the abdomen, and its posterior end (fig. 5 a) is somewhat broader than in allied forms. The setæ and spines on the upper side of fourth joint of third pair of legs are characteristic as to length, and several among them are bifid at the end (comp. the figure of Sars) and differ from those in *M. subinermis*.

A single mutilated female from our area agrees completely in all essential features with specimens from Skager Rak.

Occurrence. Not taken by the "Ingolf". But it has been gathered by the "Thor" at a single locality.

West of Iceland: Lat. 63°46′ N., Long. 22°56′ W., 79 fath.; 1 spec.

Distribution. Off the Skaw in Skager Rak, 125 fath. (Meinert).

51. **Macrostylis longipes** n. sp.

(Pl. VII, figs. 6 a—6 g).

Male. Slender, about five times as long as broad. — Head of the usual shape. — Antennulæ nearly as long as the head, somewhat robust, 5-jointed; first and second joint subcylindrical, subequal in length, together a little longer than the remainder of the appendage (fig. 6 b), and each about twice as long as deep; third joint short, thicker towards the end, scarcely as long as the fourth, which is thicker and has a transverse row of long sensory filaments a little from the end; fifth joint considerably longer than the fourth, somewhat clavate and with a number of long sensory filaments near the end. — (Antennæ lost, excepting the three small and slender proximal joints). — Maxillipeds with their distal joints as in *M. subinermis*.

Thorax slender. The three anterior segments combined slightly longer than broad. Fourth segment a little narrower than the third, short, two and a half times as broad as long, with the postero-lateral angles broadly rounded. The three posterior segments subequal in length, equal in breadth, and slightly narrower than fourth segment; their postero-lateral part at each side (fig. 6 f) produced conspicuously backwards and a little outwards, distally rounded, and seen from above the posterior part of the coxæ is perceived at their ends, but spines seem to be wanting; seventh segment scarcely one-third as broad again as long. First segment has a strong and somewhat long, acute ventral process directed mainly downwards (fig. 6 a); sixth segment with a broad, low, acute process, while the process on seventh segment is slender, somewhat long, acute and directed downwards and a little backwards.

The three anterior pairs of legs of usual length and shape. Third pair (figs. 6 c) somewhat slender; the spine on third joint somewhat long and straight; most of the setæ or spines on the two following joints of middle length and scarcely bifid at the end. Fourth pair, as usual, shorter than the third, not one-third as long as the animal; the four posterior pairs increase gradually in length backwards, but so much that sixth pair are a little longer than all thoracic segments combined, and seventh pair nearly half as long again as the entire animal, thus showing a quite anomalous development. Sixth pair (fig. 6 d) slender in proportion to their length; fifth joint is almost three times, and sixth joint twice as long as the fourth; seventh joint is a little more than half as long as the fourth and shorter than the claw. Seventh pair (fig. 6 e), and especially almost their distal half, very slender; second joint with a row of very fine and somewhat short setæ along the proximal half of the posterior margin, while the anterior margin has only about four setæ; third joint is slightly longer than the second; fifth joint is somewhat more than twice as long as the fourth but even slightly shorter than the sixth, which is extremely long; seventh joint nearly as long as the fourth, extremely slender, and a little longer than the setiform claw.

Abdomen conspicuously shorter than the two posterior segments combined (fig. 6 f), somewhat less than twice as long as broad, considerably tapering towards the base and again narrowing before the postero-lateral parts, each of which is somewhat produced outwards as a triangle; the hind margin is unusually long, conspicuously longer than the basal breadth of the abdomen, and only moderately convex, slightly concave near the insertions of the uropods. — The operculum (fig. 6 g) occupies about three-fourths of the length of the ventral excavation; its parts differ considerably from those in *M. spinifera* or *M. abyssicola*, but as they seem to be somewhat deranged in the specimen, I have figured them as well as possible without removing them from the animal, and omit a description. The anal doors are short, and situated considerably behind the operculum close at the end of abdomen. — (The uropods are lost).

Length 2·9 mm.

Remarks. *M. longipes* is distinguished from the other species by the enormous length of seventh pair of legs, as I suppose that the unknown female agrees with the male in this feature. In the antennulæ and the shape of the three posterior thoracic segments this male differs considerably from the same sex of the preceding forms.

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 fath., temp. ÷ 0·9°; 1 spec.

Group VIII. Nannoniscini.

Body oblong, considerably depressed, with the sides expanded. Head free; eyes wanting. Antennulæ dorsal, short, with very few joints in the flagellum. Antennæ well developed; squama distinct. — Mandibles with the incisive part, the movable lacinia, and the setæ well developed; the molar process tapers strongly to the narrow, obtuse, setiferous end, and is directed somewhat backwards; palp 3-jointed. Palp of the maxillipeds with second joint much expanded and the two distal joints small; epipod very long. — Thoracic segments movable, excepting that sixth and seventh segments are generally fused at the middle. The thoracic legs inserted on the ventral side; first pair rarely really prehensile, generally simple; the six other pairs without processes from first joint, adapted for walking, and sometimes the three posterior pairs have, besides, natatory setæ on fifth and sixth joints, furthermore they are moderately slender and not differing much in length; an accessory claw frequently distinct. — Abdomen at most with a vestige of a basal segment; uropods ventral, somewhat small biramous, with unjointed rami.

Remarks. This group comprises three genera from our area, two among them established as new (see the foot-note to *Nannoniscella*). The animals are in general aspect somewhat similar to species of *Ianira*, but they differ from all Ianirini in several important features, above all in the mandibles. The antennulæ are inserted on the upper surface of the head somewhat from the lateral margins and considerably or far behind the anterior margin of the head; between the antennulæ the surface of the head shows a median broad area narrowing forwards, and both on the sides end in front conspicuously marked off, on the sides generally by keels or sharp margins, while its anterior end generally is free, seen from above limited by a line; the shape of this part, which I name the front area, affords excellent characters.

Nannoniscella n. gen.

Description. Body considerably flattened. Head anteriorly irregularly rounded, with the front area well developed and reaching nearly beyond the anterior margin (Pl. VIII, figs. 1 a—1 b); the head is laterally expanded, with each lateral part produced forwards as a somewhat large triangular plate outside the proximal part of antennula and antenna. — Antennulæ moderately short (figs. 1 a—1 b); first joint large and thick; second joint slender and shorter than the first; flagellum with few joints. Antennæ intermediate in shape and length between those in *Ianira* and *Nannoniscus*; squama well developed, triangular; fifth and sixth peduncular joints rather long. — Mouths-parts (Pl. VII, figs. 7 a—7 d) in the main as in *Nannoniscus*; left mandible (fig. 7 a) has the incisive part somewhat long and slender, the movable lacinia thin, the setæ moderately numerous, the molar process directed somewhat backwards and very slenderly conical, with some short setæ on the end. Maxillæ (fig. 7 c) with the inner lobe somewhat narrow. Maxillipeds (fig. 7 d) long; second joint moderately large, somewhat less than twice as long as broad, its lobe long, not quite twice as long as broad; third to fifth joints very broad, and the fourth a little broader than long; sixth joint small with an oblong lobe, seventh quite small; epipod very long and proportionately narrow, nearly four times as long as broad.

Thoracic segments (fig. 1 a) rather crowded together and rather expanded; fifth and sixth segments with more than half of their posterior margins very concave, while seventh segment has the major part of its anterior margin very convex, and the segment itself is more than twice as long at the middle than at the sides; the dorsal limit between sixth and seventh segment is distinct in its entire length, but whether the articulation is movable is somewhat dubious. In front of the lateral part of first segment is seen a somewhat small narrow plate (fig. 1 b, *ep*) projecting outwards and forwards, and this plate must be considered an epimeral process from the base of first pair of legs. — All legs of middle length, rather slender and adapted for walking (figs. 1 d—1 e); but first pair are yet somewhat shorter, and distally more robust than the other pairs; seventh joint with its short claw is on first pair (fig. 1 d) of very moderate length, on the other pairs (fig. 1 e) somewhat longer and slightly thinner; an accessory claw not developed.

Abdomen broad, laterally much expanded (figs. 1 a and 1 f), posteriorly rounded. Operculum in the female oblong, and it occupies a very small part of the ventral surface (fig. 1 f). — Uropods ventral, moderately small, biramous, with the rami unjointed. — (Male unknown).

Remarks. This genus[1] is on the whole allied to *Nannoniscus*, but differs in the following particulars: the antennulæ are normal, not terminating in a vesicle; a pair of epimeral plates are found at first segment, sixth and seventh segments dorsally marked off from one another, and the female operculum is very small.

Only a single species is known.

52. **Nannoniscella groenlandica** n. sp.

(Pl. VII, figs. 7 a—7 d; Pl. VIII, figs. 1 a—1 f.)

Female (with marsupium). Body about two and a half times as long as broad; lateral margins of the major anterior part, viz. head and the four thoracic segments, are, taken as a whole, somewhat convex, while the remaining thoracic segments and the anterior part of the abdomen have the lateral margins nearly parallel, and this posterior section is conspicuously narrower than second or third segment.

The front area on the head is subtriangular, with the anterior end broadly obtuse and rounded; its lateral margins without keels. The protruding lateral plates reach about to the base of the antennal squama (fig. 1 b) and have the end acute. — Antennulæ a little shorter than the head; flagellum 3-jointed, scarcely as long as the two distal peduncular joints combined. — Antennæ with the peduncles almost half as long as the animal; sixth joint considerably longer than the fifth and almost as long as the flagellum, which is 8-jointed, with first joint about as long as the sum of the five following joints; squama nearly as long as third peduncular joint, much longer than broad, acute.

The four anterior thoracic segments have their antero-lateral angles acute, but scarcely produced and without any terminal spine. The epimeral plates with the end very obliquely cut off, acute.

Abdomen almost half as broad again as long; the major part of the lateral margins and the terminal margin constitute a semicircular outline. — Operculum (fig. 1 f) very small, longer than broad, increasing in breadth from the base to far beyond the middle, somewhat ovate, but the median half of the posterior margin is a little concave, and the whole posterior margin has a number of long setæ. — Uropods with the peduncle narrow at the base and widening much to the very oblique end; endopod slightly longer than the peduncle, somewhat longer and thicker than the exopod.

Length of the ovigerous female 2·2 mm.

Remarks. The female is easily distinguished from every other form of northern Asellota by a number of features; unfortunately the male is not known.

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

West Greenland: Lat. 64°03′ N., mouth of Ameralik Fjord, 5—70 fath., shells: 1 spec.

[1] After Pls. VII—VIII had been finished, I discovered that Vanhöffen in 1914 had established the genus *Austroniscus*, with three antarctic species. It is not improbable that a more thorough examination of various features in his animals may show that one or two — but scarcely the third — of his species are congeneric with my *Nannoniscella groenlandica*, and if that be the case, the generic name given by me must be cancelled. But at our present state of knowledge I prefer to keep the name *Nannoniscella* until the male of my new species has been found and some points in the structure of the thoracic segments, etc. of Vanhöffen's animals have been investigated.

Nannoniscoides n. gen.

Description (based on a mutilated male). Body considerably depressed. Head peculiarly shaped; the front area is limited by a pair of exceedingly high and thick keels, and at each side the head is produced into a very large, thick, oblong, subtriangular process directed somewhat outwards and then curved forwards, so that the proximal parts of the antennulæ and antennæ are situated in a hollowing between the process and the keel. — Antennulæ inserted considerably from the lateral margins, short; first joint thick and somewhat short; second joint slender and rather short; flagellum with few joints. Antennæ lost, excepting the four proximal joints; squama very short. — Mouth-parts nearly as in *Nannoniscus;* right mandible (fig. 2 c) has the incisive part somewhat long, several setæ, and the molar process moderately short, tapering to the moderately narrow, setiferous end, and directed considerably backwards; maxillipeds (fig. 2 e) long, second joint a little more than twice as long as broad, and its long lobe twice as long as broad; third and fourth joints very broad, and the fourth about as broad as long; fifth joint considerably narrower than the fourth; sixth joint short and somewhat broad, without any real lobe; seventh joint small; epipod triangular, long, acute, slightly more than three times as long as broad.

First thoracic segment considerably narrower than the head, with the sides rounded and no epimeral processes; second segment much broader than the first, at each side produced forwards into a large, triangular process directed forwards and a little outwards, while the other segments have no processes. Third segment is narrower than the second and broader than the fourth, and from the fourth the segments increase in breadth to abdomen. Seventh segment is short, and the median part of its dorsal surface so completely fused with sixth segment that no limit is seen. — (Legs mutilated).

Abdomen broad, much broader than long. Male operculum somewhat large (fig. 2 d), with the median lamella very broad and near the end produced much outwards. — Uropods ventral, very small, biramous.

Remarks. This genus is easily separated by the shape of the head and the anterior thoracic segments from all other forms. It is intermediate between *Nannoniscella* and *Nannoniscus,* agreeing with the former and differing from the latter of these genera in having the antennulæ normal, while it agrees with the latter and differs from the former in having the median dorsal part of sixth and seventh thoracic segments completely fused.

Only a single species is known.

53. Nannoniscoides angulatus n. sp.

(Pl. VIII, figs. 2 a—2 e.)

Male (mutilated). Body not fully three times as long as broad, with the lateral parts somewhat expanded. — Head (fig. 2 b) almost twice as broad as long; the thick and high upper keels converge somewhat forwards and protrude considerably beyond the anterior transverse and straight margin of the front area. The lateral processes are deep, being triangularly keeled above, considerably longer than broad, with the end obtuse. — Antennulæ somewhat shorter than the head; flagellum

3-jointed, not much shorter than the peduncle, and its terminal joint considerably longer than the second. — The antennal squama very small, much broader than long.

Lateral processes of second thoracic segment reach as far forwards as the front margin of first segment; each process terminates in a small spine inserted on the obtuse end. The peculiar furrows on the four anterior segments are shown on fig. 2 a.

Abdomen distinctly broader than the posterior thoracic segments, about one-third as broad again as long. The lateral margins proximally somewhat convex and then slightly converging to the postero-lateral angles which protrude as somewhat small triangular corners; the posterior margin is very long and considerably convex, excepting a somewhat short concave part towards the lateral angles. The median part of the ventral side of the two posterior thoracic segments is vaulted, with a moderately large, oblong, obtuse process (fig. 2 d) somewhat in front of the operculum, which is much vaulted; the very broad median lamella of the operculum is posteriorly emarginate, and each postero-lateral part produced into a long, somewhat curved and narrow, acute process directed outwards. — The uropods are very small, with the endopod a little longer than the exopod.

Length of the single specimen 2·2 mm.

Remarks. The male of this species is abundantly distinguished from other Asellota by the keels and processes on the head, the two anterior thoracic segments and the shape of the abdomen. Unfortunately the female is unknown.

Occurrence. Taken by the "Ingolf" in the cold area.

North of the Færoes: Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; 1 spec.

Nannoniscus G. O. Sars.

This genus was established in 1869 on females of a single species taken off the Lofoten Islands. Several years later Sars described another species, *N. bicuspis* G. O. S., but in 1908 Harriet Richardson with good reason removed it from *Nannoniscus* and made it the type for a new genus, *Haploniscus* Rich. In 1897 Sars established *N. caspius* on a male from the Caspian Sea. Such was the state when Sars in his "Account" published description and figures of the type *N. oblongus* G. O. S., thereby giving the first detailed account of a species of this genus. He described and figured not only the female but, besides, an animal which he believed to be the male of the same species. His two specimens supposed to be males had the testes visible through the integuments (comp. the figure of this male from above on his Pl. 50), while the operculum is an undivided round plate, thus shaped as in a female. According to his figure his male is in reality the female of a very different species, and the occurrence of testes in female specimens is certainly very interesting. But it is known that in the Cymothoinæ and some of the Epicaridea the specimens are first males and then females; furthermore, vestiges of hermaphroditism have been found in *Sphæroma*, and it is undoubtedly something of this kind which has been found by Sars in his two specimens. My statement is sure, because I have both males and females of *N. oblongus* — and of four other species — and the first pair of legs are always completely similar in both sexes, while in the specimen figured by Sars as the male of *N. oblongus* first pair of legs are very thickened and, besides, armed with a few very strong spines, thus differing very much from the rather slender first pair in the females of *N. oblongus;* furthermore, not only the operculum but the outline of the body and the flagella of the antennæ in the specimen figured by Sars as the male show exclusively female features. Consequently I consider the specimens described by Sars as being the males of *N. oblongus* to be in reality immature females with protandrous features in the internal sexual organs of a species with the first pair of legs very thickened; I propose the name *N. crassipes* for this peculiar form.

Until 1914 G. O. Sars was the only author who had published anything based on personal observation on the genus *Nannoniscus*. In 1914 E. Vanhöffen established (in: Die Isopoden der Deutschen Südpolar-Exped. 1901—1903) two new species from the Antarctic Ocean, but descriptions and figures are rather poor. My material from the "Ingolf" area is extremely rich, comprising 13 species, 12 of which are new; of five species both males and females, of eight species only females, are to hand. Sars' figures of the female of *N. oblongus* and of the male of *N. caspius* convey together an excellent idea of the genus, but the rich material enables me to add some remarks to his description of the genus, and to point out some sexual differences.

The outline of the body differs somewhat in the two sexes. In the females at least the three anterior thoracic segments are somewhat or considerably broader than the three posterior segments and abdomen, while in the males the anterior segments are a little narrower, but the posterior segments and abdomen broader, than in the other sex, with the result that in the males the posterior half of the body is almost or completely as broad as the anterior portion (Pl. VIII, fig. 3 a; Pl. IX, fig. 2 a). The front area on the head is marked off laterally, and in most species by keels, each terminating anteriorly in an acute angle; the anterior margin of the front area is straight, concave or convex, and the length of this margin differs always in the sexes, being longer in the females than in the males, and it affords excellent specific characters.

The antennulæ are extremely characteristic (many figures on Pls. VIII—X), differing materially from those in any other Isopod, but the representations published by Sars are not quite correct. They are always rather short and consist of five joints. First joint is large, thick and more or less oblong; second joint is more or less slender at the base and increases in thickness to the end, which is cut off and, besides, produced in probably always three short protuberances or somewhat long processes; third joint is extremely short and thin, and not unfrequently difficult to perceive, while the fourth joint, which is short, is at the inner side of the end produced into a very conspicuous, oblong, oblique process. Fifth joint is always a vesicle, ovate (for inst. figs. 2 d and 7 c on Pl. IX) or, rarely, very oblong (Pl. IX, fig. 4 b), at least frequently with a couple of fine hairs on the distal part of the lower side; it is attached to the end of fourth joint by an extremely narrow articulation.

The antennæ have the squama distinct, sometimes quite small, in *N. oblongus* and especially in *N. caspius* long; it is most frequently, but not always (as in *N. oblongus*, Pl. VIII, fig. 4 f) marked off by a suture from third joint. Fifth and sixth joints moderately long. The flagellum is slender and normal in the females; while in the males a considerable part (Pl. VIII, fig. 6 d) or almost the whole flagellum (Pl. IX, fig. 6 a) is thickened, and in the thickened part the joints are fused and not discernible. — The mouth-parts have been well described by Sars.

All thoracic segments movable excepting sixth and seventh segments, as these are immovably fused both above and below, the median half of the articulation between them having completely vanished, while a suture or articulation is distinct towards the lateral margin (Pl. VIII, figs. 3 a and 6 a; Pl. IX, figs. 2 a, 3 a, and 7 a), a structure overlooked by Sars, who has drawn this articulation as if it were complete; the figures cited show, besides, that the articulation between fifth and sixth segments is not straight, but peculiarly bent. The absence or presence of a high tubercle or process, or of two processes, on the posterior part of the ventral surface of the thorax affords excellent specific, but scarcely sexual, characters. — First pair of legs are always a little and sometimes considerably or much thicker than the following pairs; in most species this pair have few spines of very moderate length, but in *N. inermis* n. sp. and *N. crassipes* n. sp. they are more or less prehensile organs with long, strong spines on fifth joint. An accessory claw is frequently discernible and is sometimes strong. In the males known to me of three species and in the females of *N. inermis* n. sp., the three posterior pairs of legs have a number of very or extremely long natatory setæ along the upper margin of fifth and sixth joints (Pl. VIII, fig. 3 h; Pl. IX, figs 1 a and 4 e), while in the males of *N. reticulatus* n. sp. and *N. plebejus* n. sp. and in females of all species excepting *N. inermis* no such setæ were found.

The shape of the posterior part of abdomen differs sometimes in the two sexes (Pl. VIII, figs. 3 i and 3 k). In both sexes a considerable or large part of the ventral surface of the abdomen is not covered by the operculum, which is nearly circular or oblong; in the male the median lamella is somewhat broad, and its distal part affords specific characters. The uropods are ventral, moderately small, biramous; the endopod considerably or, rarely, slightly longer than the exopod.

Remarks. The best generic character is the very curious structure of the distal part of the antennulæ; their terminal vesicle is, as far as I know, without parallel in any other Crustacean. None of the species — excepting *N. caspius* G. O. S. — is found in low water, and most of them are real deep-sea forms. The males seem generally to be much more rare than the females, but that may be explained by the supposition that most of them, at least to some degree, have natatory habits. I think that future and really thorough deep-sea investigations will lead to the discovery of a great number of species in all oceans.

The females of the thirteen species described here, together with *N. crassipes* n. sp., may be pivided into two sections, and determined by the aid of the following keys.

Sect. I. Abdominal operculum with an acute process on the lower surface (sometimes this process may be partly broken off, but the irregular shape of the remaining protuberance reveals that it has existed).

Sect. II. Abdominal operculum without any tubercle or process on the lower surface.

Section I.

A. Antero-lateral angles of first thoracic segment terminating in a spine; the angles of second segment with a short, fine seta .... 1. *N. simplex* n. sp.

B. Antero-lateral angles of first segment without any terminal spine, but with or without a fine seta; angles of second segment with a real spine.

a. Surface of the body without reticulation.

α. First or second segment not half as broad again as sixth segment.

§. Abdomen with the margin just outside the base of each uropod convex or straight.

†. Antennal squama long at least about as long as the diameter of third peduncular joint. Head at least six times as broad as the distance between the anterior ends of the keels limiting the front area .... 2. *N. oblongus* G. O. Sars.

††. Antennal squama conspicuously shorter than the diameter of third peduncular joint. Head about four and a half times as broad as the distance between the anterior ends of the keels limiting the front area .... 3. *N. arcticus* n. sp.

§§. Abdomen with the lateral margin just outside the base of each uropod considerably concave, as the posterior median part of the abdomen is produced backwards. 4. *N. analis* n. sp.

β. First and second segments conspicuously more than half as broad again as sixth segment. 5. *N. laticeps* n. sp.

b. Surface of the body with a reticulate network........................ 6. *N. reticulatus* n. sp.

Section II.

A. Second joint of the antennulæ terminates in short or moderately long processes leaving nearly the entire fourth joint uncovered. Abdominal operculum posteriorly rounded or straight.

a. Posterior ventral area of the thorax without any process.

α. Antennular vesicle very long and narrow, between two and a half and three times as long as broad. Uropods with the endopod much longer than the exopod... 7. *N. inermis* n. sp.

β. Antennular vesicle pyriform, not half as long again as broad. Uropods with the endopod slightly longer than the exopod.................................. 8. *N. æquiremis* n. sp.

b. Posterior ventral area of the thorax with a large, curved, acute process, but without any second process.

α. Postero-lateral margin of the abdomen without any incision or tooth.

§. First pair of legs moderately slender, without strong spines on the lower margin of fifth joint... 9. *N. plebejus* n. sp.

§§. First pair of legs extremely thick, with two very long and robust spines on the lower margin of fifth joint .... 10. *N. crassipes* n. sp.[1]

β. Postero-lateral margin of the abdomen at each side with an incision and a very conspicuous triangular angle or tooth .... 11. *N. minutus* n. sp.

c. Posterior ventral area of the thorax with an extremely large, curved, acute process, and in front of this in the median line a long, slender and straight process .... 12. *N. armatus* n. sp.

B. Second joint of the antennulæ terminating in long, oblong-triangular processes overlapping the fourth joint. Operculum posteriorly angular or even produced in an acute process.

a. Anterior margin of the front area nearly half as long as the breadth of the head. Fourth joint of the six posterior pairs of legs terminating in a short seta .... 13. *N. spinicornis* n. sp.

[1] This species, which has been briefly mentioned on p. 87—88, is established on the so-called male of *N. oblongus* figured by Sars on Pl. 50. His figures and description are quite sufficient for recognizing this fine species, which has not been taken out of Norway.

b. Anterior margin of the front area considerably less than half as long as the breadth of the head. Fourth joint of the six posterior pairs of legs terminating in a long and very strong, spiniform seta.. 14. *N. affinis* n. sp.

54. **Nannoniscus simplex** n. sp.

(Pl. VIII, figs. 3 a—3 l).

Female. Body as to general outline nearly as in *N. oblongus* G. O. S. (comp. the figure of Sars), from a little less to somewhat more than three times as long as broad, with second and third thoracic segments not much broader than the posterior segments, and the lateral margins of fourth segment converging only moderately backwards.

Head between four times and four and a half times as broad as the distance between the anterior ends of the keels limiting the front area (fig. 3 c), and the anterior margin of this area is straight. — Antennulæ (fig. 3 d) with first joint somewhat longer than broad; second joint slightly longer than the first and moderately slender, with the distal outer angle somewhat, the inner angle slightly, produced; the process from fourth joint reaches at most the middle of the pyriform vesicle; the foot of each of the long setæ on second joint transverse. Antennal squama well marked off, very oblong, acute, shorter than the diameter of third peduncular joint (fig. 3 d).

First thoracic segment with a well developed spine on each antero-lateral angle — as in the male, fig. 3 b. — angles of second and third segments with a short, stiff seta. The two posterior segments with a high, broad, rounded ventral protuberance (figs. 3 k and 3 l) lying close at the front margin of the abdominal operculum, and without any process. — First pair of thoracic legs (fig. 3 e) not much thicker than second pair; fifth joint on the lower margin with a seta beyond the middle, and at the end a long seta and a somewhat small spine; sixth joint with a spine before the middle and one at the end; accessory claw thin. Second pair with about four short spines on the lower margin of fifth joint, and four on the sixth joint. Seventh pair (fig. 3 f) has on the lower margin of fifth joint two moderately strong and two distal, long spines, three spines on sixth joint, but no natatory setæ on these joints; accessory claw strong.

Abdomen (fig. 3 k) with the lateral margins distinctly, but yet rather feebly, convex, converging to the somewhat narrowly rounded or subacute end. — Operculum a little longer than broad, posteriorly rounded, on the ventral surface with a high protuberance terminating in an acute process directed backwards (figs. 3 k and 3 l). — Uropods with the peduncle somewhat longer than broad; endopod distally thicker than at the base, and not fully twice as long as the exopod.

Length of the largest adult specimen 2·6 mm.

Male. Body a little more than three times as long as broad, with the lateral margins subparallel (fig. 3 a). The head is about six and a half times as broad as the distance between the anterior ends of the keels limiting the front area (fig. 3 b), consequently the keels converge considerably more than in the females, and besides they are higher, more protruding with their ends free; the anterior margin between the keels is straight. — Antennulæ and proximal part of the antennæ as in the female (the flagella of the antennæ lost).

The thorax, as already mentioned, differs somewhat from that of the female in outline, as first and second segments are only slightly broader than the sixth segment; the antero-lateral angles of first segment with spines, of second and third segments with setæ as in the female; the rounded ventral posterior protuberance (fig. 3 i) as in the other sex. — First pair of legs (fig. 3 g) nearly as in the female; seventh pair (fig. 3 h) differs from those in the female in having the most distal spine on fifth joint short, while a long, stiff seta has replaced the long spine in the female; furthermore the three posterior pairs have some long setæ on a part of the upper margin of fifth joint, and many extremely long setæ on the upper margin of sixth joint.

Abdomen (figs. 3 a and 3 i) differs in outline conspicuously from that in the female, as the lateral margins are scarcely or slightly convex, converge to a point somewhat beyond the insertions of the uropods, and then each margin bends abruptly much more inwards, thus constituting half of the posterior margin and being slightly concave; the end of abdomen is angular, but not acute. — Operculum slightly longer than broad; the median lamella is widened near the end, and each outer angle produced into a very conspicuous, slender process directed somewhat backwards and much outwards; consequently the posterior margin of each pleopod is convex. — Uropods about as in the female.

Length 1·9 mm.

Remarks. As shown in the key (p. 89) *N. simplex* is easily separated from the other forms of this section, and in reality from most of the other species of the genus seen by me, in having well developed spines on the lateral angles of first segment, and only stiff setæ on the angles of second and third segments. In general appearance it is nearly similar to *N. oblongus* G. O. S., but the outline of the male abdomen is different, and the postero-lateral processes of the median opercular lamella afford a good character.

In the marsupium of a female (from Stat. 90) a species of *Sphæronella* with ovisacs (family Choniostomatidæ) was found.

Occurrence. Taken by the "Ingolf" at two stations in the warm area.

West of Iceland: Stat. 90: Lat. 64°45′ N., Long. 29°06′ W., 568 fath., temp. 4·4°; 2 spec. (♀).

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 10 spec. (6 ♀, 4 ♂).

55. **Nannoniscus oblongus** G. O. Sars.

(Pl. VIII, figs. 4 a—4 f).

1870. *Nannoniscus oblongus* G. O. Sars, Forh. Vid. Selsk. Christiania for 1869, p. 164.

! 1897. — — G. O. Sars, Account, II, p. 119; Pl. 50. (partim; the animal described and figured as the male is the female of *N. crassipes* n. sp.).

Female. Body from somewhat less to somewhat more than three times as long as broad, with second and third segments only one-fifth or one-sixth as broad again as the sixth segment, while the margins of fourth segment converge only moderately backwards.

Head from six to eight, frequently about seven, times as broad as the distance between the anterior ends of the keels limiting the front area (fig. 4 a), and the short anterior margin of this area is concave. — Antennulæ (fig. 4 c) in the main as in *N. simplex*; first joint somewhat longer than broad; second joint slender, a little longer than the first, with its terminal processes nearly as long as broad; the process of fourth joint reaches beyond the middle of the pyriform vesicle; the foot of each of the long setæ on second joint oblong. — Antennal squama not marked off at its base, longer than in any other species, excepting *N. caspius* G. O. S., from a little (fig. 4 c) to considerably or much (fig. 4 f) longer than the diameter of third joint.

Second thoracic segment (fig. 4 a) with a moderately short spine on the antero-lateral angles, while the corresponding angles of first and third segments have a fine or stiff, short seta. The posterior ventral median part of the thorax raised as a high and broad, rounded protuberance, which lies close to the front end of the abdominal operculum, and has no process. — The legs nearly as in *N. simplex*.

Abdomen with the lateral margins somewhat convex and converging (fig. 4 e), and the posterior margin moderately broadly rounded at the end. — Operculum about as long as broad, with the posterior margin nearly straight or even slightly concave, while the median proximal part of the lower surface is much vaulted and armed with a recurved, acute process. — Uropods with the peduncle oblong, the endopod thicker and very considerably longer than the exopod.

Length of full-grown specimens 2—2·6 mm.

Male. Body about three and a half times as long as broad, with the anterior part of the thorax a little broader than the posterior. — The head is nearly nine times as broad as the distance between the anterior angles of the keels limiting the front area (fig. 4 b), as the keels converge strongly, and protrude conspicuously with their acute ends. — Antennulæ and proximal joints of the antennæ as in the female (the antennal flagella lost). — Thoracic legs as in the female, excepting that the three posterior pairs have natatory setæ on fifth and sixth joints as in the male of *N. simplex*. (In a very young male, 1·1 mm. long, the natatory setæ were wanting).

Abdomen differs in outline from that of the female, as its median posterior part is produced backwards (fig. 4 d) with the end somewhat narrowly rounded, and the margins somewhat before this end are distinctly concave. — Operculum a little longer than broad; the median lamella a little widened towards the end, with each outer angle produced into a triangular tooth directed backwards and a little outwards, while the major terminal part of the lamella constitutes a kind of lobe with the hind margin semicircular. — Uropods with the peduncle distally somewhat produced, otherwise nearly as in the female.

Length of the largest male 2·2 mm.

Remarks. *N. oblongus* is easily separated from *N. arcticus* and *N. analis* in having considerably shorter distance between the anterior ends of the keels on the head, and the squama considerably longer; from *N. simplex* it is instantly distinguished in having spines on the antero-lateral angles of second instead of first segment.

As mentioned above, there is in the females some variation in the distance between the end of the keels of the front area and in the length of the squama. In most females from Stat. 78 the distance mentioned (fig. 4 a) is shorter than in specimens from Stat. 32, and it is still longer in some specimens from Norway. As I was not quite sure that my reference of the "Ingolf" specimens to *N. oblongus* was correct, because Sars has figured the female with the distance between the keels still shorter than in any of my specimens, and the operculum less cut off posteriorly, Prof. Sars, on my request, kindly sent me some fine females, but these have the frontal emargination as broad as, or even a little broader than, in my specimens from Stat. 32, thus differing in this feature much from his figure, and the squama is in these Norwegian specimens much longer (fig. 4 f) than the diameter of third peduncular joint, longer than in any of the "Ingolf" specimens. After careful examination of the females to hand from various places I think that they all belong to *N. oblongus* G. O. S. That the animal described and figured by Sars as the male is in reality a not adult female of a very different form, *N. crassipes* n. sp., is proved on p. 87—88.

Occurrence. Taken by the "Ingolf" at three stations in the warm area.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 8 spec. (♀).

West of Iceland: Stat. 98: Lat. 65°38′ N., Long. 26°27′ W., 138 fath., temp. 5·9°; 1 spec. (young ♂).

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 14 spec. (3 ♂, 11 ♀).

Distribution. Sars established *N. oblongus* on specimens captured "off the Lofoten Islands, at Skraaven, in depths ranging from 120 to 250 fathoms". The specimens he sent to me have been taken after the publication of his work quoted at Korshavn, near Cape Lindesnæs (south end of Norway).

56. **Nannoniscus arcticus** n. sp.

(Pl. VIII, figs. 5 a—5 d).

Female. So closely allied to *N. oblongus*, that it may be sufficient to deal with features deviating from what is found in that species. — The head (fig. 5 a) about four and a half times as broad as the distance between the anterior ends of the keels limiting the front area; the anterior margin between these keels is deeply concave. — The antennulæ a little longer than in *N. oblongus*; first joint distinctly shorter than the second (fig. 5 b); the process from fourth joint reaches considerably beyond the middle of the pyriform vesicle. — Antennal squama marked off and considerably shorter than the diameter of third peduncular joint.

The two posterior thoracic segments with the median part of the ventral side strongly vaulted (fig. 5 c). — The operculum, which is a little longer than broad, has the posterior margin considerably convex, and the ventral process is short and placed somewhat near the base. — The uropods have the peduncles short and broad, the endopod considerably thicker, but only somewhat shorter, than the exopod, which is longer than in the two preceding species.

Length of the best specimen, a female without marsupium, 2·8 mm.

Remarks. *N. arcticus* is distinctly larger than *N. oblongus*, and among the differences mentioned those drawn from the distance between the front end of the cephalic keels and the length of the squama are easily observed and are certainly valid specific characters. While *N. oblongus* is known only from the warm area, *N. arcticus* is a cold water form.

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

South of Jan Mayen: Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 1 spec. (poor).

Besides, it has been taken by the IInd Amdrup Exped. at East Greenland in Forsblad Fjord, Lat. 72°17′ N., 90—40 fath., 1 fine spec.

57. **Nannoniscus analis** n. sp.

(Pl. VIII, figs. 6 a—6 k; Pl. IX, figs. 1 a—1 b).

Female. Body (fig. 6 a) from three to nearly three and a half times as long as broad, with second and third thoracic segments considerably broader than, viz. even a little more than one-third as broad again as, the two posterior segments, while the lateral margins of fourth segment converge only moderately backwards, and the fifth segment is conspicuously broader than the sixth.

Head (fig. 6 a) four times, or a little more than four times, as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin between these keels is feebly concave. — Antennulæ (fig. 6 c) nearly as in *N. oblongus*. — Antennæ nearly half as long as the body; flagellum more than half as long again as fifth or sixth peduncular joint, 13-jointed, with first joint about as long as the three following joints; squama marked off, conical and considerably shorter than the diameter of third joint.

Second thoracic segment with a distinct, or even somewhat long, spine on the antero-lateral angles, while the angles of first and third segments have no spines, but frequently a short, fine seta. The median ventral part of seventh segment raised as a high protuberance (figs. 6 i and 6 k) lying close to the front margin of the abdominal operculum, and anteriorly stretching forward on the posterior part of sixth segment, which, besides, has a tubercle of its own. — Legs somewhat similar to those in *N. simplex*, but the accessory claw is more or less feeble on all pairs; the first pair (as in the male, fig. 6 e) are distinctly thicker than the second or third pair (fig. 6 f), with two small spines on the lower margin of fifth joint, while fifth joint of third pair has five spines; the three posterior pairs (fig. 1 b) with still fewer spines than in *N. simplex* and no natatory setæ.

Abdomen (figs. 6 a and 6 i) almost as long as broad, with the outline very characteristic, as the lateral margins outside the base of the uropods are conspicuously concave with an angular bend, because they turn somewhat suddenly inwards and then nearly abruptly backwards, as the median posterior part of abdomen is produced almost as a lobe rather broadly rounded at the end. — Operculum (figs. 6 i and 6 k) slightly longer than broad, posteriorly rounded; its proximal median part is highly raised and produced into a long, strong, acute process directed backwards and considerably downwards. — Uropods (fig. 6 i) with the peduncle short, the endopod somewhat slender and not quite twice as long as the very slender exopod.

Length of large specimens 2·7 mm.

Male. Body not quite three and a half times as long as broad; the anterior third of the thorax only a little broader than the two posterior segments. — Head (fig. 6 b) between five and four and a half times as broad as the distance between the ends of the cephalic keels, and the anterior margin of the front area is a little concave. — Antennulæ as in the female. — Antennæ (fig. 6 d) nearly as in the female excepting the flagellum, which is extremely different; the flagellum has its proximal part extremely thickened, oblong-oval and as long as the four following slender joints combined (the end of flagellum lost).

Thoracic segments, excepting as to the breadth mentioned, nearly as in the female; the ventral posterior protuberances scarcely as high as in that sex. — The three posterior pairs of legs (fig. 1 a) with about four long setæ on the upper margin of fifth joint, and a good number of very or extremely long setæ on sixth joint.

Abdomen posteriorly nearly as produced as in the female, but rather gradually (fig. 6 h), so that the distal third of the lateral margins is flatly and feebly concave, while the end is more narrowly rounded than in the female. — Operculum conspicuously longer than broad; the median lamella a little widened near the end, with the distal outer angle a little produced, triangular, while most of the terminal part of the lamella constitutes a kind of rounded lobe, divided of course in the median line. — Uropods about as in the female, excepting that their peduncles are a little longer.

Length 2·1 mm.

Remarks. The female is instantly separated from all other species by the shape of the posterior part of abdomen, while the male may be distinguished by some features taken together: the breadth of the frontal emargination, the somewhat short antennal squama, the shape of the abdomen and of the median lamella of the operculum.

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

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2·4°; numerous spec. (16 ♂ and at least 50 ♀).

58. **Nannoniscus laticeps** n. sp.

(Pl. IX, figs. 3 a—3 d).

Young Female (with seventh pair of legs not fully developed). — Body (fig. 3 a) about three and a half times as long as broad. Head and the two anterior segments about two-thirds as broad again as sixth segment and abdomen; third segment not much narrower than the second, and somewhat broader than the fourth, which has its lateral margins converging extremely backwards.

Head (fig. 3 b) fives times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area slightly concave. — Antennulæ (fig. 3 c) with first joint a little longer than broad; second joint distinctly longer than the first, somewhat thick, with the terminal protuberances rather short; the process from fourth joint reaches conspicuously beyond the middle of the uncommonly small, oblong vesicle. — Antennal squama marked off, short, much shorter than the diameter of third peduncular joint.

Antero-lateral angles of second segment terminate in distinct spines (fig. 3 b), while the angles of first and third segments terminate in fine setæ. The posterior median part of the ventral side considerably vaulted.

Abdomen (figs. 3 a and 3 d) conspicuously longer than broad, posteriorly very broadly rounded, and the lateral margins nearly parallel. — Operculum somewhat longer than broad, with the posterior margin considerably convex and, besides, almost angular, as a small median part is feebly produced; a spiniform, moderately small process projects on the ventral surface somewhat near the base, and at least in my single specimen it is directed nearly horizontally backwards. — Uropods with the exopod distinctly more than half as long as the endopod; that the rami are uncommonly robust may probably, at least to some degree, be due to the young stage of the animal.

Length of the young specimen 1·4 mm.

Remarks. The extreme breadth of the head and two anterior segments as compared with the posterior segments renders it impossible to refer this specimen to any of the other species of this section (viz. forms with a ventral process on the female operculum), even if we suppose that a part of the difference may be due to age. Furthermore it differs materially in the shape of the operculum.

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

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°32′ W., 293 fath., temp. ÷ 0·5°; 1 spec.

59. **Nannoniscus reticulatus** n. sp.

(Pl. IX, figs. 2 a—2 l).

Female (without marsupium). The body has the upper surface nearly everywhere adorned with a most conspicuous reticulated network (fig. 2 c); it is from somewhat less to somewhat more than three and a half times as long as broad, and the two anterior thoracic segments are somewhat, though not much, broader than the sixth or the seventh segment.

Head (fig. 2 c) about four times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area is rather deeply concave. — The antennulæ (fig. 2 d) differ from those in *N. oblongus* in having second joint somewhat thicker, and the process from fourth joint shorter, scarcely reaching the middle of the pyriform vesicle. — Antennæ lost, excepting the proximal joints; squama oblong-triangular, much shorter than the diameter of third joint.

Second thoracic segment (fig. 2 c) with the lateral parts produced considerably forwards, the end cut off and armed with a proportionately long spine, while first and third segments have their lateral parts much less produced, and on their angles at most short setæ. Median ventral part of the three posterior segments very characteristic, especially when seen from the side (fig. 2 i); fifth segment raised in a thick, high, distally rounded protuberance; seventh segment vaulted as a very high protuberance having a kind of incision in the posterior half, which is lower than the anterior half, and the latter is cut off and angular, with its posterior angle even sometimes produced a little backwards; the protuberance of sixth segment is somewhat lower than that of the seventh, subconical, with the end obtuse. — Legs normal; first pair (fig. 2 e) distinctly thicker than the following pairs, with two well developed spines on fifth and on sixth joints, and the accessory claw slender; the six other pairs have only some few spines, and the three posterior pairs no natatory setæ.

Abdomen (figs. 2 h and 2 i) as long as, or a little shorter than broad, posteriorly feebly or scarcely produced, with the margins outside the uropods straight or slightly convex, and the posterior end rounded. — Operculum slightly longer than broad (fig. 2 h), posteriorly at the middle feebly, but distinctly, produced in a broad angle; its proximal part, seen from the side (fig. 2 i) much vaulted and produced in a process of a very moderate size, curved horizontally backwards, acute. — Uropods normal; exopod distinctly more than half as long as the endopod.

Length of a specimen without marsupium 2 mm.

Male. Surface reticulate as in the female. Body scarcely three and a half times as long as broad; the difference in breadth between the anterior and the posterior segments (fig. 2 a) is smaller than in the female, and fourth segment is not only narrower than the first, but even a little narrower than the seventh. — Head between six and a half and six times as broad as the distance between the ends of the cephalic keels; the distal half of these keels is much more convex than in the female, and the anterior margin of the front area is extremely concave (fig. 2 b). — Antennulæ and proximal joint of antennæ as in the female.

The thoracic segments, excepting as to the breadth already mentioned, nearly as in the female; even the ventral protuberances of the two posterior segments scarcely differ from those in the female, but the protuberance on fifth segment (fig. 2 k) is distinctly lower. — Legs as in the female; no natatory setæ on the three posterior pairs.

Abdomen (figs. 2 a and 2 l) distinctly broader than long and posteriorly scarcely produced. — Operculum a little longer than broad; the median lamella much broader before the middle than towards the end, with the outer distal corner angular, and the terminal margin of each pleopod oblique. — Uropods nearly as in the female.

Length 1·8 mm.

Remarks. *N. reticulatus* is instantly distinguished from all other species hitherto known by the very conspicuous network on nearly the whole dorsal surface. The frontal emargination is uncommonly deep, especially in the male.

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

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°32′ W., 293 fath., temp. ÷ 0·5°; 6 spec. (3 ♂, 3 ♀).

60. **Nannoniscus inermis** n. sp.

(Pl. IX, figs. 4 a—4 f).

Female. Body about three and one-third times as long again as broad. Second and third thoracic segments nearly one-third as broad again as sixth or seventh segment, and the lateral margins of fourth segment converge only moderately backwards.

Head a little more than four and a half times as broad as the distance between the anterior ends of the cephalic keels (fig. 4 a), and the anterior margin of the front area is slightly convex. — Antennulæ (fig. 4 b) very characteristic; first joint longer than broad; second joint a little longer than the first, rather slender and slightly thicker towards the end, which has the angles, at most, feebly protruding; third joint is unusually long and totally visible; fourth joint with the process somewhat long, but reaching slightly beyond the middle of the vesicle, which is uncommonly narrow and long, between two and a half and three times as long as broad. — Antennæ slightly more than half as long as the body; fifth and sixth peduncular joints about equal in length, slender and somewhat thickened at the end; flagellum somewhat longer than sixth joint, with more than its proximal half unjointed, while the distal part is divided into 8 joints; squama small, triangular, slightly longer than broad, acute (fig. 4 b).

Second thoracic segment with a rather slender spine on the antero-lateral angles, and a nearly similar spine is found on each angle of third segment, while no spine or seta exists on the angles of first segment. Median ventral part of the posterior segments (fig. 4 f) considerably vaulted, but without any protuberance or process. — Legs of first pair (fig. 4 c) very considerably thicker and shorter than second pair (fig. 4 d); especially fifth joint is thickened with six strong spines, the third and the fourth long; sixth joint somewhat thick with two spines of moderate size; accessory claw slender. Second (fig. 4 d) to fourth pairs are slender; fifth joint with six or seven spines; sixth joint with about four spines; seventh joint with claw slender, and the accessory claw very small. The three posterior pairs (fig. 4 e) with some spines on fifth joint; seventh joint with claw very slender, and the accessory claw very short and thin; furthermore the fifth joint has along the half of the upper margin about seven very long setæ, and above on the sixth joint a row of extremely long natatory setæ.

Abdomen (fig. 4 f) nearly as long as broad; the lateral margins converge feebly from before the middle to the posterior margin, which consequently is long; each half of this margin is scarcely or feebly concave, as the median part of abdomen is posteriorly slightly produced backwards with the terminal margin somewhat convex. — Operculum about as broad as long, without any ventral process or protuberance; the posterior margin is straight. — Uropods with the rami slender and somewhat long; the endopod almost twice as long as the exopod.

Length of a large female with marsupium 3·3 mm.

Remarks. *N. inermis*, which is the largest species known, is in general aspect, excepting as to the posterior part of abdomen, somewhat similar to *N. analis*, but it is easily separated from this species by the shape of the posterior part of abdomen, and by having no process on the operculum. Besides, it is distinguished from all species of the genus by the elongate vesicle of the antennulæ, by the spines on first pair of legs, and finally by the fact that the female has natatory setæ on fifth and sixth joints of the three posterior pairs of legs, a feature otherwise only found in males.

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

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2·4°; 3 spec. (♀).

61. **Nannoniscus æquiremis** n. sp.

(Pl. IX, figs. 5 a—5 h).

Female. Body about three and a half times as long as broad; second, third and fourth segments are rather a little broader than the posterior segments, consequently the animal is a little more slender than *N. oblongus*, but otherwise similar in aspect.

Head (fig. 5 a) nearly more than eight times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area is considerably concave. — Antennulæ (fig. 5 b) somewhat thick; first joint somewhat longer than broad; second joint scarcely longer than the first, with the distal part rather thick, the process at the outer side somewhat large, nearly longer than thick and somewhat longer than the inner process; third joint scarcely discernible; fourth joint thick, with the process short and thick, reaching about to middle of the vesicle, which is pyriform and only a little longer than broad. — Antennal squama somewhat small, triangular, slightly longer than broad, acute.

Second thoracic segment with small spines on the antero-lateral angles; the angles of first segment with a small seta, and somewhat similar setæ on the angles of third segment. Median ventral part of the two posterior segments (fig. 5 f) considerably vaulted; on seventh segment is found a somewhat long and broad protuberance with a transverse impression (fig. 5 g) but without any acute process, and it is separated by a rather deep impression from the rounded and distinctly lower protuberance on sixth segment. — Legs moderately slender; first pair (fig. 5 c) only a little thicker than second pair, without any spine on fifth joint and with the accessory claw very distinct; the other pairs have few and nearly setiform spines, and the accessory claw strong (figs. 5 d and 5 e); the three posterior pairs without natatory setæ.

Abdomen (figs. 5 f and 5 g) a little broader than long, posteriorly broadly rounded; the posterior half of the lateral margin and the entire hind margin everywhere convex, without any concave or straight portion. — Operculum a little longer than broad, with the proximal half highly vaulted, but without any tubercle or process; the posterior margin straight. — Uropods with peduncle short and broad, the endopod considerably thicker, but only a little or slightly longer, than the exopod.

Length of a female with marsupium 1·9 mm.

Remarks. *N. æquiremis* is distinguished in having the exopod of the uropods conspicuously longer in proportion to the endopod than in any other species of the genus.

Occurrence. It has not been taken by the "Ingolf", but by the Ryder Expedition at a single place.

South of Jan Mayen: Lat. 70°32′ N., Long. 8°10′ W., 470 fath., clay with many small stones. 2 spec. (♀).

62. **Nannoniscus plebejus** n. sp.

(Pl. IX, figs. 6 a—6 g).

Female (without marsupium). Body a little more than three and a half times as long as broad; second thoracic segment a little more than half as broad again as the seventh, and the lateral margins of the fourth segment converge somewhat backwards.

Head (fig. 6 b) a little more than four times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area scarcely concave. — Antennulæ (fig. 6 c) with first joint considerably longer than thick; second joint about as long as the first, rather thick, with the outer terminal process moderately large, about as long as broad and scarcely larger than the inner process; third joint distinct; the fourth moderately thick, with its process reaching beyond the middle of the oblong-pyriform vesicle, which is somewhat or slightly less than twice as long as broad. Antennæ, judging from the length of the moderately thick fifth joint — the sixth joint with flagellum lost — probably somewhat short; squama small, triangular, acute (fig. 6 c).

Antero-lateral margins of the three anterior segments (fig. 6 b) without spines, each terminating in a somewhat small, stiff seta. The median ventral part of seventh segment (fig. 6 f) is highly vaulted, forming an oblong, large protuberance, which posteriorly embraces the base of the operculum, is rounded anteriorly, and a little from the front end is produced into a strong, long, curved, acute process with its terminal part directed backwards. — Thoracic legs simple; first pair (fig. 6 d), though moderately slender, yet decidedly stronger than the other pairs (fig. 6 e); all pairs with very few spines, while the accessory claw is moderately developed on first pair, but somewhat robust on the other pairs; natatory setæ wanting.

Abdomen (fig. 6 f) as long as broad and posteriorly a little produced, with the result that the end is somewhat narrowly rounded, and the parts of the margins a little before the end are straight or slightly concave. — Operculum a little longer than broad, with the proximal half of the ventral surface much vaulted, but without any tubercle or process; the posterior margin is convex. — Uropods somewhat large; peduncle oblong; endopod somewhat robust and twice, or more than twice, as long as the slender exopod.

Length of a female without marsupium, but having the ovaries swollen with eggs, 1·6 mm.

Male. Body about four times as long as broad; first thoracic segment (fig. 6 a) at least as broad as the second, and almost or fully half as broad again as seventh segment, which is conspicuously broader than the front end of fifth segment.

Head five to five and a half times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area is a little concave. — Antennulæ as in the female. — Antennæ (fig. 6 a) not reaching the posterior angle of fourth thoracic segment; fifth peduncular joint proportionately longer and conspicuously thicker than in the female, sixth joint slightly longer than the fifth and gradually thicker towards the end; flagellum nearly as long as sixth joint, somewhat fusiform and thickest at the end of the proximal third, unjointed excepting the terminal slender part, which is marked off as a joint; squama as in the female.

Antero-lateral angles of the three anterior segments with setæ as in the female; the ventral protuberance of seventh segment nearly as in the female, excepting that the process is still longer. — Legs as in the female; no natatory setæ on the posterior pairs.

Abdomen (fig. 6 g) shaped as in the female. — Operculum a little longer than broad; the median lamella broad, moderately tapering and slightly widened at the end; the posterior margin of each pleopod somewhat sinuate, and the postero-lateral margin not produced. — Uropods as in the female.

Length 1·2 mm.

Remarks. According to the specimens to hand *N. plebejus* must be a small species. It differs from all preceding forms and agrees with *N. crassipes* n. sp., *N. minutus* n. sp. and *N. armatus* n. sp. in possessing a large, curved, acute process on the vaulted ventral part of seventh thoracic segment, but from these three species it is easily separated by the characters in the key (p. 90). The shape of the body, no spines on the antero-lateral angles of any of the three anterior thoracic segments, and the uropods, afford other good characters.

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

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 7 spec. (4 ♂, 3 ♀).

63. **Nannoniscus minutus** n. sp.

(Pl. IX, figs. 7 a—7 h).

Female. Body (fig. 7 a) about four times as long as broad; first segment slightly broader than the second and half as broad again as seventh segment, which is at least as broad as the front end of fifth segment; the major part of the lateral margins of fourth segment converge moderately backwards.

Head (fig. 7 b) about three times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area a little convex. — Antennulæ (fig. 7 c) with first and second joints nearly as in *N. plebejus;* fourth joint with the process long, reaching conspicuously beyond the middle of the pyriform vesicle, which is about half as long again as broad. — Antennæ in a female with young in the marsupium reaching about the anterior angle of third thoracic segment; the two distal peduncular joints proportionately short and moderately thick; flagellum much longer than sixth peduncular joint, 8-jointed, but its first joint is nearly as long as the three following joints combined, and somewhat thickened; squama small, triangular, acute.

First thoracic segment (fig. 7 b) with an uncommonly long and moderately strong spine on each antero-lateral angle; second segment with minute spines, and third segment with short, stiff setæ on the angles. Median ventral part of seventh segment vaulted and produced into a strong, long, very curved, acute, almost hook-shaped process (figs. 7 g and 7 h). — First pair of legs (fig. 7 d) somewhat robust, while the other pairs (fig. 7 e) are slender; fifth joint of first pair with a feeble spine at the middle of its lower margin, and a more developed spine at the end; the accessory claw somewhat slender on all pairs; the three posterior pairs without natatory setæ.

Abdomen (figs. 7 f, 7 g and 7 h) somewhat longer than broad; the second third parts of the lateral margins converge a little to a point outside and slightly before the base of the uropods, where each margin suddenly is incised, forming a very conspicuous, sharp angle or even a low, triangular tooth; the posterior margin, which is moderately broadly rounded at the end, runs to the bottom of each incision. — Operculum (figs. 7 g and 7 h) a little longer than broad, posteriorly very broadly rounded, with the proximal half moderately vaulted and without any tubercle or process. — Uropods somewhat slender; endopod not quite twice as long as the exopod.

Length of a female with young in the marsupium 1·5 mm.

Remarks. *N. minutus* is a small species easily separated from all northern forms by the incisions in the margin of the abdomen. In this respect it agrees with the antarctic form *N. bidens* Vanh., which has been insufficiently described and figured, but so much can be seen, that this species is much larger than *N. minutus*, and its antennæ proportionately much longer than in our form.

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

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 3 spec. (♀).

64. **Nannoniscus armatus** n. sp.

(Pl. X, figs. 1 a—1 f).

Young Female (last pair of legs only half developed). — Body (fig. 1 a) somewhat less than four times as long as broad, with the anterior half and especially first and second thoracic segments broad while the major posterior half is narrow, as second segment is even slightly more than half as broad again as sixth segment, which is somewhat broader than the front end of fifth segment and a little broader than fourth segment; the major portion of the lateral margins of third segment converge exceedingly, those of fourth segment very considerably backwards, while the margins of fifth segment converge a little forwards.

Head (fig. 1 b) nearly four times as broad as the distance between the anterior ends of the cephalic keels, and the anterior margin of the front area is nearly straight. — Antennulæ, as far as could be ascertained, have the second joint longer than the first and rather thickened towards the end, which has the inner process well developed and the outer small; the process of fourth joint is long, the vesicle somewhat small, pyriform. — Antennal squama small, triangular.

Second thoracic segment seems to have only a stiff seta on the antero-lateral angles; on the angles of first and third segments no setæ or spines could be discovered. The ventral median part of seventh and the posterior part of sixth segment much vaulted and produced into a very strong and extremely long process (figs. 1 e and 1 f), which is directed downwards and somewhat backwards, while its most distal, acute part is curved much backwards; in front of this process projects from the anterior part of sixth segment a long, slender, acute process (fig. 1 e) directed vertically downwards. — First pair of legs (fig. 1 c) very moderately robust and slightly thicker than second pair; fifth joint with two setæ on the lower margin, sixth joint conspicuously longer than the fifth; accessory claw well developed. Second (fig. 1 d) to fourth pair very characteristic, as the fifth joint has on the lower margin a moderately long spine at the middle, a very long, slender spine near the end, and a little before the latter a long third spine; sixth joint has the distal half somewhat thick. The posterior pairs distinctly more slender than the others, without natatory setæ.

Abdomen (figs. 1 a and 1 f) a little longer than broad, subtriangular, with the end somewhat narrowly rounded and the lateral margins rather feebly convex. — Operculum distinctly broader than long, with the posterior margin semicircular, and without any tubercle or process on the ventral surface. — Uropods with the exopod small, considerably less than half as long as the endopod, which in the young specimen is somewhat thick.

Length of the specimen, which has seventh pair of legs only half-grown, 1·6 mm.

Remarks. *N. armatus* is easily distinguished from all other species of the genus in having a long, slender, straight process on sixth segment in front of the very long, strong and curved process of seventh segment. The four anterior pairs of legs afford further valuable characters. Though the shape of the body in the adult female may differ somewhat from that of the young specimen described — probably the posterior half as the body is proportionately somewhat less narrow in the adult — the features pointed out will certainly prove to be sufficient for determination.

Occurrence. Taken by the "Ingolf" at its deepest station in the warm area.

South of Davis Strait: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 1 spec.

65. **Nannoniscus spinicornis** n. sp.

(Pl. X, figs. 2 a—2 g).

Female (not quite full-grown). Body even a little more than four times as long as broad, with the anterior segments more arched and more deeply telescoped (fig. 2 a) than in any of the preceding species; second segment about one-third as broad again as the seventh, which is distinctly broader than the front end of the fifth.

Head conspicuously longer than usual in proportion to its breadth; the cephalic keels very low, scarcely converging anteriorly (fig. 2 a), without real anterior angles, but the distance between their anterior parts is only a little less than half of the breadth of the head; the anterior margin of the front area is a little convex. — Antennulæ (figs. 2 b and 2 c) very peculiar; first joint uncommonly narrow, more than half as long again as broad; second joint longer than the first, gradually increasing considerably in thickness from the base to the end, which is produced into three long, oblong-triangular, acute or subacute processes; the right antennula (fig. 2 b) drawn in its natural position shows only two of these processes, as the third process is covered by the vesicle, furthermore only the outer part of third joint is visible to the left, and the fourth joint itself is covered by the left process of second joint, while the process of fourth joint is uncovered and is long, more than half as long as the ovate vesicle. The left antennula had been turned in a different direction and, seen from above (fig. 2 c), the three terminal processes of second joint are visible from above, the fourth joint lies between two of these processes, and its major part is uncovered, but its process is completely covered. — Antennæ lost, excepting its proximal joints; squama (fig. 2 a) small, broader than long, with the lateral margins subparallel, and the terminal margin long, transverse.

Antero-lateral angles of the three anterior segments scarcely or slightly produced, acute, but spines or setæ were not discoverable. Median ventral part of seventh segment (figs. 2 f and 2 g) somewhat vaulted, and a little before its posterior margin produced into a small, acute process directed backwards. -- Thoracic legs partly mutilated; judging from the second joint of first pair of legs these are at most a little thicker than second pair; the six posterior pairs (fig. 2 d) are rather slender, and the outer angle of fourth joint has a short seta.

Abdomen (figs. 2 e and 2 g) a little longer than broad, with the end rounded but yet subangular, and most of the margins regularly convex. — Operculum considerably longer than broad, subpentagonal, as the basal margin is long and very moderately convex, the lateral margins feebly convex and distally suddenly curved much inwards, the posterior part of the plate produced backwards, with the tip forming an angle of about 100°, and each half of the posterior margin a little concave. — Uropods (fig. 2 g) somewhat long; the peduncle very broad, the endopod rather robust and about twice as long as the slender exopod.

Length of the specimen 1.5 mm.

Remarks. *N. spinicornis* is abundantly distinguished from all species described on the preceding pages by the antennulæ, the very long anterior margin of the front area and the shape of the operculum; besides, the strong telescoping of the anterior segments is very characteristic. The differences between *N. spinicornis* and the following species are pointed out below.

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

South of Jan Mayen: Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 1 spec.

66. **Nannoniscus affinis** n. sp.

(Pl. X, figs. 3 a—3 c).

Female (without marsupium). Closely allied to *N. spinicornis* and agreeing with it in most features, above all in the antennulæ, the shape of the antennal squama, and the anterior thoracic segments, thus in important characters separating *N. spinicornis* and *N. affinis* from all other northern species. It is in reality sufficient to point out the three or four differences between *N. affinis* and *N. spinicornis*.

The keels on the head as in *N. spinicornis* without anteriorly protruding ends, and continued in the convex anterior margin of the front area (fig. 3 a), but the keels converge considerably forwards, so that the anterior margin of the area is much shorter than in *N. spinicornis*, being between one-third and one-fourth of the breadth of the head. — The ventral process on seventh thoracic segment (fig. 3 c) is much longer and stronger than in *N. spinicornis*. Thoracic legs — first pair lost — in the main as in *N. spinicornis*, but the angle of fourth joint (fig. 3 b) terminates in a long, very strong, spiniform seta almost as long as the joint. — Operculum (fig. 3 c) almost half as long again as broad, posteriorly conspicuously more produced than in *N. spinicornis*, and terminating in a somewhat small, nearly spiniform median process.

Length of the largest specimen scarcely 1·3 mm.

Remarks. It was only after some hesitation that I established *N. affinis* as a species. I think, however, that the differences pointed out between it and the preceding form will prove to be valid specific characters; furthermore *N. affinis* was secured at a pronounced warm-water station, while *N. spinicornis* was gathered at one of the deepest and most typical cold-water stations.

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

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath.; temp. 4·5°; 2[1] , spec. (mutilated).

Group IX. Desmosomatini.

Body very oblong, moderately depressed. Head free; eyes wanting. Antennulæ dorsal, short, with very few joints in the flagellum. Antennæ moderately long, thicker in the males than in the females; squama not perceptible. Mandibles with the incisive part, the movable lacinia, and the setæ well or very moderately developed; the molar process reduced, rather short or short, tapering to the narrow, setiferous end, and directed somewhat backwards; palp 3-jointed or wanting. Palp of the maxillipeds nearly as in Nannoniscini; epipod somewhat long. — Thoracic segments movable, divided into two very different sections. The four anterior pairs of thoracic legs inserted on the sides of the segments, and at least second to fourth pairs with well developed epimera; first pair very different from the following pairs, and frequently strongly prehensile; the three following pairs of moderate length, adapted for walking and more or less fossorial, especially second pair. The three posterior pairs without epimera, decreasing conspicuously in length from fourth to seventh pair, and fourth pair longer than any other pair: these three pairs conspicuously natatory, having fifth and sixth joints flattened and somewhat or feebly expanded, with a moderate or low number of natatory setæ, and seventh joint well developed. -- Abdomen at most with a rudimentary basal segment; uropods ventral, the endopod unjointed, frequently moderately long, the exopod short or wanting.

Remarks. This group comprises three genera hitherto established, viz. *Desmosoma* G. O. Sars, *Eugerda* Meinert and *Echinopleura* G. O. Sars, but for reasons given later on I cancel *Eugerda* and refer its species to the large genus *Desmosoma*. The group occupies in certain features a position between the Nannoniscini and the Ilyrachnini, but differs materially from both in several characters, especially in the legs. The head has a more or less developed "front area" as described in the Nannoniscini.

Desmosoma G. O. Sars.

This genus has, on the whole, been well characterized by Sars, but I must cancel the genus *Eugerda* Meinert adopted by Sars. On *Desmosoma*, as limited in the present paper, some points may be mentioned.

The antennulæ have in the flagellum 2 joints, in the male of a single species 3 joints, when the peduncle is considered as 3-jointed. At the lateral margins of the four anterior thoracic segments epimera are always visible, and at least on second to fourth segment always marked off by a suture, while such a suture is sometimes distinct, sometimes not discernible, between first segment and the epimera; the shape of the epimera, especially of first and second pairs, affords excellent characters, but it must be added, that in some species (f. inst. *D. longispinum*: Pl. X, figs. 6 a and 6 e) the epimera are somewhat or considerably more produced in the male than in the female. At the margins of the three posterior segments no epimera are found; these segments are frequently proportionately broader or sometimes narrower in the male than in the female; besides, the shape of fourth segment may differ according to sex (Pl. XI, figs. 5 b and 5 c). In *D. laterale* G. O. S. the four anterior segments have on the ventral surface a long, spiniform process in the median line; in *D. longispinum* a small process protrudes obliquely forwards on first segment, and in some forms no ventral armature is found, but the feature has not been examined in several species.

First and second pairs of thoracic legs differ so much in shape and adornment with setæ or spines from species to species, that they afford some of the best characters, and must always be carefully studied. First pair are in some species considerably or extremely slender, and their use seems to be somewhat uncertain, while in other forms they are thick and, sometimes, even very strong prehensile organs. Second to fourth pairs are to some degree similar in structure, but second pair are stronger and more peculiar than the third, and especially than the fourth pair. To the brief description above of the three posterior pairs of legs may be added that in the male of *D. natator* (Pl. XI, fig. 2 d) these legs are on the whole rather similar to the same legs in males of some species of *Nan-*

noniscus. — The abdomen is generally broader in the male than in the female, and in some species it shows further sexual differences. The female operculum seems to be rather uniformly shaped; the median lamella in the male operculum shows specific differences, but they are sometimes difficult to investigate without dissection.

The single character between *Desmosoma* and *Eugerda* is drawn from the number of rami in the uropods. But this character cannot be of generic value, as, for instance, *D. armatum* G. O. Sars, which has no exopod on the uropods, is in the structure of the legs, etc., very closely allied to *D. (Eugerda) coarctatum* G. O. Sars or *D. (Eugerda) politum* n. sp., which both have biramous uropods; *D. armatum* is in reality more closely allied to these two species than to such forms with single-branched uropods as *D. lineare* G. O. Sars or *D. insigne* n. sp. Therefore the genus *Eugerda* must be suppressed as not only valueless but misleading.

From the North Atlantic with ramifications like Skager Rak, Kattegat, and the Mediterranean, 9 species were known, described by Sars, Meinert, Bonnier, and Stephensen. Of these only 3 are represented in the material from the "Ingolf" area, but I here establish 8 new species. Thus no less than 17 species are known from the North Atlantic, including the cold area. I have, however, mutilated specimens of still 5, or more, new species, but, as the specimens have lost the main part of the two anterior pairs of legs, I do not think it advisable to describe them.

These seventeen species may be divided into two sections, and determined by the aid of the following keys. The species not found in the "Ingolf" area are put in brackets and without number.

Sect. I. First pair of legs with fifth and sixth joints slender; fifth joint has the lower margin either glabrous or with some few hairs or stiff setæ.

Sect. II. First pair of legs with fifth and sixth joints much thickened; especially fifth joint is very thick, with a very long and strong spine on the lower distal angle and in several species, besides, with a single spine or a few strong spines along the lower margin.

Section I.

A. Uropods biramous. Fifth joint of first pair of legs with the lower margin either naked or bearing a couple of hairs. (First thoracic segment only about half, or less than half, as long as the second).
- a. Fifth and sixth joints of first pair of legs extremely thin and elongate; fifth joint many times longer than thick .... (*D. tenuimanum* G. O. S.)
- b. Fifth and sixth joints of first pair of legs slender; fifth joint at most nearly five times as long as deep.
  - *α*. Epimera of second thoracic segment triangular, with the anterior half acute or obtuse. Fifth joint of second pair of legs distinctly more than twice as long as deep, with 9—11, rarely 7 or 8, spines and setæ along the lower margin .... 1. *D. globiceps* Mein.
  - *β*. Epimera of second thoracic segment with the anterior half rounded in front. Fifth joint of second pair of legs scarcely twice as long as deep, with 7 extremely strong, thick spines along the lower margin .... 2. *D. latipes* n. sp.

B. Uropods without exopod. Fifth joint of first pair of legs with some setæ on the lower margin, the most distal seta at least half as long as sixth joint.

a. Abdomen posteriorly rounded, without postero-lateral angles. First thoracic segment considerably shorter than, or almost only half as long as, the second.

α. Fifth joint of first pair of legs at the distal lower angle with a single seta, which is only half as long as sixth joint .... (*D. lineare* G. O. S.)

β. Fifth joint of first pair of legs at the distal lower angle with two setæ, which are almost as long as sixth joint .... (*D. elongatum* Bonnier)

b. Abdomen with produced and acute postero-lateral angles. First thoracic segment about as long as the second.

α. Basal joint of the uropods much thickened, and these joints nearly touching one another at the median line of the animal, and covering the anal doors. Epimera at first and second segments in both sexes produced into very long processes......... 3. *U. longispinum* n. sp.

β. Basal joint of the uropods not much thicker than the endopod, and very remote from the median line. Epimera at first and second segments produced into moderately long or short processes.

§. Lower margin of fifth joint of first pair of legs with four setæ, of fifth joint of second pair with five setæ. Somewhat small species........................ 4. *D. simile* n. sp.

§§. Lower margin of fifth joint of first pair of legs with five setæ, of fifth joint of second pair with about eight setæ. Moderately large species............. 5. *D. gracilipes* n. sp.

Section II.

A. Uropods biramous. (Abdomen with produced and acute postero-lateral angles).

a. Outer angle of the head at the insertion of the antennula not produced into a free, outwards projecting process. Fifth joint of first pair of legs with three to five strong spines along the lower margin and at the end.

α. Fifth joint of first pair of legs with four spines along the lower margin, and a fifth somewhat short spine just above the very long spine projecting from the distal angle. Lateral margins of fifth segment scarcely concave, a little converging backwards. 6. *D. politum* n. sp.

β. Fifth joint of first pair of legs with three spines along the lower margin, and a fourth rather long spine just above the long spine projecting from the distal angle. Lateral margins of fifth segment (in the male) deeply concave, and each antero-lateral angle produced and terminating in a spine .... 7. *D. natator* n. sp.

γ. Fifth joint of first pair of legs with three spines along the lower margin, and no spine above the long spine projecting from the distal angle. Lateral margins of fifth segment in both sexes deeply concave, and the antero-lateral angles broadly rounded, without any spine. (*D. coarctatum* (Hansen, MS.) G. O. S.)

b. Outer angle of the head at the insertion of the antennula produced into an oblong-triangular, acute process directed freely somewhat outwards. Fifth joint of first pair of legs with only two spines and an intermediate seta on the lower margin, and no spine above the very long spine projecting from the distal angle .... 8. *D. laterale* (Hansen, MS.) G. O. S.

B. Uropods without exopod.

a. Abdomen with produced and acute postero-lateral angles. Fifth joint of first pair of legs with four spines along the lower margin, and a minute spine close above the very long spine from the distal angle .... 9. *D. armatum* G. O. S.

b. Abdomen posteriorly rounded, without produced postero-lateral angles. Fifth joint of first pair of legs with three spines or a single spine on the lower margin, and no spine above the very long spine projecting from the distal angle.

α. Fifth joint of first pair of legs with three spines on the lower margin, the terminal spine included .... (*D. angustum* (Hansen, MS.) G. O. Sars)

β. Fifth joint of first pair of legs with a single spine, the terminal, on the lower margin.

§. Lower margin of fifth joint of first pair of legs more than twice as long as the depth of the joint and slightly shorter than sixth joint, which is about four times as long as deep. Fifth thoracic segment in the female much broader at the anterior than at the posterior margin and more than twice as broad as the length of the median line, with the lateral margins convex, and the surface strongly reticulate. Very large species. (*D. chelatum* Stephensen).

§§. Lower margin of fifth joint of first pair of legs a little less than twice as long as the depth of the joint, and slightly shorter than sixth joint, which is almost three times as long as deep. Fifth thoracic segment in the female much broader at the anterior than at the posterior margin, a little more than twice as broad as the length of its median line, with the lateral margins a little concave near the middle, and the surface strongly reticulate. Moderately large species................................ 10. *D. insigne* n. sp.

§§§. Lower margin of fifth joint of first pair of legs scarcely half as long again as the depth of the joint, and considerably shorter than sixth joint, which is conspicuously less than three times as long as deep. Fifth thoracic segment in the female narrower at the anterior than at the posterior margin, not one-third as broad again as the length of its median line, with the lateral margins scarcely concave at the middle, and the upper surface scarcely reticulate. Small species .... 11. *D. plebejum* n. sp.

67. **Desmosoma globiceps** Meinert.
(Pl. X, figs. 4 a—4 b).

1890. *Eugerda globiceps* Meinert, "Hauch"s Togter, p. 194; Pl. II, figs. 53—62.
? 1899. — — G. O. Sars, Account, II, p. 252; Suppl. Pl. III, fig. 1.

The figures and description published by Sars may be sufficient for the recognition of this species, but a few points may be mentioned here.

First thoracic segment (fig. 4 a) is very short, only about half as long as the second, with the epimera somewhat produced and terminating in a spine. The anterior part of the epimera of second segment is distinctly produced, triangular, with the end acute or obtuse, terminating in a short seta. — As figured by Sars, the legs of first pair are slender, and fifth joint without setæ on the lower margin. Second pair of legs with fifth joint (fig. 4 b) very characteristic, compressed, somewhat expanded below and almost oblong-triangular, distinctly more than twice as long as deep, but scarcely ever more than two and a half times as long as deep (in the figure of Sars it is somewhat too narrow), with 9—11 — rarely, and perhaps anomalously, with 7 or 8 — spines and setæ along the lower margin, the three or four distal ones being very long and rather thick, spiniform with their terminal part setiform, the others gradually much shorter and thinner, so that the three or four proximal ones are real setæ; besides, 6 or 7 long setæ are found in a row on the outer side of the joint below the upper margin; sixth joint is conspicuously more than twice as long as deep, with 2 setæ on the lower and 7 to 9 setæ on the upper margin, most of them long, and about the 3 distal ones very strong, nearly spiniform. — The abdomen, which has been well figured by Sars, is characteristic, a little longer than broad, ovate; the uropods are proportionately long, a little more than half as long as the abdomen, with the rami slender, and the exopod almost or not fully half as long as the endopod.

Length of the largest specimen (from East Greenland) 2·6 mm.

Remarks. *D. globiceps* is easily distinguished from *D. tenuimanum* G. O. S. in having the first pair of legs much stronger and shorter, a considerably lower number of spines and setæ on fifth and sixth joints of second pair of legs, etc. The differences between *D. globiceps* and *D. latipes* are pointed out later on.

Occurrence. Not taken by the "Ingolf".

The IInd Amdrup Exped. captured 2 large females with marsupium at East Greenland near Cape Dalton, Lat. 69°30' N., 9—11 fath. At East Iceland Dr. A. C. Johansen secured 1 spec. in Breiddals Vik, 6 fath., mud and black sand; at the Færoes 4 spec. have been gathered by Dr. Th. Mortensen in Klaksvig, 10—15 fath.

Distribution. It has been taken at 10 places in the eastern and southern Kattegat, $12^1/_2$—44 fath. (H. J. Hansen), in the northern part of the Sound, 12—22 fath. (W. Björk), and at 3 places in the Skager Rak, 6 to 15 miles from Jutland, 70 to 125 fath. (Meinert). It has not yet been discovered at Norway or Great Britain.

68. **Desmosoma latipes** n. sp.

(Pl. X, figs. 5 a—5 f).

Female. Allied to *D. globiceps*. — First thoracic segment (fig. 5 a) not half as long as the second; the epimera scarcely produced, blunt or rounded. Second segment large; the epimera anteriorly rounded. Fourth segment a little longer than the first, but only a little more than half as long as the second. Fifth segment in the adult female somewhat narrower in front than behind, with the lateral margins gradually somewhat diverging backwards; in the younger female (fig. 5 a) the anterior part of the lateral margins converges extremely forwards.

First pair of legs (fig. 5 b) with the distal half nearly more slender than in *D. globiceps*; fifth joint with two thin and somewhat short setæ on the lower margin. — Second pair (figs. 5 c and 5 d) extremely robust and conspicuously stronger than in *E. globiceps*; their fifth joint not quite twice as long as deep, with seven spines along the lower margin; the five distal spines are extremely thick excepting their short setiform terminal part; furthermore, the two distal spines are extremely long, and the spines gradually decrease much in length from the penultimate to the most proximal; finally the basal spine is moderately slender and somewhat short, with the end setiform, on the outer side of the joint somewhat below the upper margin eight strong, stiff setæ arranged in a row. The sixth joint is twice as long as deep, with four setæ on the lower and nine along the upper margin; seventh joint not marked off from the short claw. — (Seventh pair of legs lost.)

The abdomen (fig. 5 e) seems to be proportionately a little longer than in *D. globiceps* and, besides, less ovate. — Uropods a little more than half as long as the abdomen; the exopod slightly more than half as long as the endopod (fig. 5 f).

Length of the single female with marsupium 2·2 mm.

Remarks. As already stated, *D. latipes* is allied to *D. globiceps*, but it is easily distinguished by the second pair of legs, especially by its proportionately broader fifth joint with the very thick spines, and by the broader sixth joint with four setæ along the lower margin.

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

Davis Strait: Stat. 25: Long. 63°30′ N., Lat. 54°25′ W., 582 fath., temp. 3·3°; 5 spec. (mutilated).

69. Desmosoma longispinum n. sp.

(Pl. X, figs. 6 a—6 i).

Female and Male. The whole upper surface of the body peculiarly sculptured, as each segment is adorned with numerous longitudinal, though somewhat irregular and partly interrupted, fine keels. — First thoracic segment large, a little longer than the second, which is as long as, or a little longer than, the fourth; in the male (fig. 6 e) the epimera at all four segments are produced into extremely long processes, a little or somewhat longer than their segment and differing little in length, while in the female (fig. 6 a) the processes of the two first pairs are not much shorter than in the male, but the third pair are considerably and fourth pair much shorter than in that sex; the first pair of processes are in both sexes directed forwards, the following pairs, besides, gradually somewhat outwards. Fifth segment a little broader near the anterior than at the posterior margin, with the lateral margins slightly concave, and the antero-lateral angles broadly rounded; the segment is in the female somewhat, in the male only a little, broader than long.

First pair of legs (figs. 6 b and 6 g) slender; fifth joint about five times as long as deep, at the lower distal angle with two stiff setæ somewhat shorter than sixth joint, and two somewhat shorter setæ on the lower margin, the most proximal near its middle; sixth joint slender with a single seta at the lower distal end. — Second pair (fig. 6 c) somewhat longer than, but almost as slender as, first pair; fifth joint more than five times as long as deep, increasing slightly in depth from base to end, with five stiff setæ along the lower margin, and the distal seta inserted at the distal angle and almost as long as sixth joint; the last-named joint has two long setæ at the distal part of its upper margin, and a single short seta at the middle of the lower margin; seventh joint is uncommonly long. — Seventh pair of legs (fig. 6 d) slender; fifth joint with about seven thin setæ on the distal part of the lower margin, and some of them (probably five) extremely long; sixth joint very slender, with about four long setæ and one shorter seta on the lower margin.

Abdomen in the female (fig. 6 a) considerably longer than broad, subrectangular, with the antero-lateral angles rounded, and the postero-lateral angles produced into oblong processes directed somewhat outwards, much backwards and considerably downwards; the posterior margin between the base of these processes a little convex, and the lateral margins slightly converging from rather near the base to somewhat from the end. — In the male the abdomen (fig. 6 e) is proportionately broader than in the female, with the major proximal part of the lateral margins somewhat convex, and the posterior margin more convex than in the female. — The operculum in the female posteriorly broadly rounded; in the male (fig. 6 i) each of the pleopods of first pair tapers conspicuously in breadth from somewhat from the base to considerably beyond the middle, and then the outer margin suddenly turns considerably outwards, so that the distal part of the pleopod is a rather large triangle, with the posterior margin a little convex. — Uropods (fig. 6 i) very peculiar, considerably less than half as long as the abdomen; basal joint very large, with the inner margin straight and lying close at the median line of the animal, so that the peduncles of the uropods completely overlap the anal doors when seen from below; endopod more than half as long again as the peduncle, slender; exopod wanting.

Length of a female without marsupium 2·1 mm., of the male 1·8 mm.

Remarks. *D. longispinum* has the epimera at the four anterior thoracic segments produced into longer processes than in any other species hitherto known, though in this character it shows affinity to *D. simile* and the male of *D. gracilipes*. The sculpture on the surface of the animal is very characteristic of *D. longispinum*. The two anterior pairs of legs are somewhat similar to those in *D. simile*, though a little more slender and elongate. But in the very broad peduncles of the uropods and in their inner margins lying close at the median line *D. longispinum* differs sharply from all other species.

Occurrence. Taken by the "Ingolf" at its deepest station in the warm area.

South of Davis Strait: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 4 spec.

70. **Desmosoma simile** n. sp.

(Pl. X, figs. 7 e—7 e).

Female. First thoracic segment about as long as the second or the third, and a little shorter than the fourth (fig. 7 a). The epimera at these segments anteriorly produced into very oblong-triangular, moderately long processes, each terminating in a distinct, small and short spine; the processes decrease a little in length from first to fourth pair, and the first pair are considerably shorter than their segment. Fifth segment more than half as broad again as long; the anterior margin is straight, the antero-lateral angles produced into very conspicuous, triangular, acute processes directed outwards, and the anterior part of each lateral margin is somewhat concave.

First pair of legs (fig. 7 b) rather slender; fifth joint about three and a half times as long as deep. at the lower distal angle with two very strong, stiff setæ somewhat shorter than sixth joint, while two somewhat shorter, stiff setæ are found respectively before and beyond the middle of the lower margin; sixth joint with about three setæ on the lower margin. — Second pair of legs (fig. 7 c) rather slender; fifth joint nearly three and a half times as long as deep, increasing slightly in depth from the base outwards; its lower margin has five stiff setæ, the two distal, placed at the angle, are thick and very long, the longest even considerably longer than the sixth joint; furthermore the outer side of the joint has about five long setæ placed in a row below the upper margin; sixth joint has three long setæ on the distal half of the upper margin, and on the lower margin a small seta at the middle and a couple at the end. — Seventh pair of legs (fig. 7 d) long and very slender; fifth joint with only three setæ, two of which very long, on the distal part of the lower margin; sixth joint with four setæ on the lower margin, and at least two of them very long.

Abdomen (fig. 7 a) slightly longer than broad, but otherwise somewhat resembling that in *D. longispinum*, excepting that the posterior margin between the postero-lateral acute processes is somewhat more convex than in the female of that species. — Uropods half as long as the abdomen, and inserted moderately far from one another (fig. 7 e); the peduncle only somewhat thicker than the endopod; exopod wanting.

Length of an ovigerous female 2·2 mm.

Remarks. The female of this species (the male is unknown) is separated from *D. longispinum* in having especially the two anterior pairs of epimeral processes much shorter, the anterior angles of fifth segment produced into processes, setæ above on the outer side of fifth joint of second pair of legs, the uropods much removed from the median line, and their peduncles of normal size. The differences between *D. simile* and *D. gracilipes* are pointed out in the "remarks" on the last-named species.

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

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 5 spec.

71. **Desmosoma gracilipes** n. sp.

(Pl. XI, figs. 1 a—1 f).

Female and Male. First thoracic segment slightly longer than the second, which is about as long as the third or the fourth. In the female (fig. 1 a) the epimera at first segment are anteriorly produced into a subtriangular process, about as long as broad and terminate in a minute spine; the epimera at the three following segments are similarly shaped, but from first to fourth pair gradually a little shorter. In the male (fig. 1 f) the epimera are anteriorly produced in processes more than twice as long as in the female, and even longer than in the female of *D. simile*; each process terminates in a small spine. Fifth segment in the female more than half as broad again as long, with all angles rounded, and the lateral margins subparallel, though slightly concave; in the male (fig. 1 f) this segment is half as broad again as long, and differs especially from that in the female in having the anterior angles acute and a little produced outwards.

First pair of legs (fig. 1 b) rather slender; fifth joint somewhat more than three times as long as deep, with five very strong setæ along the lower margin, the two distal of these setæ placed close together at the angle and only somewhat shorter than sixth joint. — Second pair (fig. 1 c) moderately slender; fifth joint about three and a half times as long as deep and somewhat increasing in breadth from base to the end, its lower margin with eight strong setæ, the two most distal even very robust and somewhat longer than sixth joint, and, besides, a row with eight setæ is seen on the outer side of the joint below the upper margin; sixth joint has seven setæ on the upper and three on the lower margin. — Seventh pair (fig. 1 d) slender; fifth joint with four long setæ and one shorter seta on the lower margin; sixth joint very slender, with about six setæ on the lower margin.

Abdomen in the female (fig. 1 a) somewhat longer than broad, decreasing distinctly in breadth from a little from the base to near the produced acute angles, which are somewhat small processes directed mainly backwards; the posterior margin between these two teeth very convex. The male abdomen (fig. 1 f) is larger and especially distinctly broader than in the other sex, has the postero-lateral angles a little more produced, and the posterior margin between them a little less convex. — Uropods (fig. 1 e) not quite half as long as the abdomen, rather distant from one another; the basal joint only a little thicker than the endopod; exopod wanting. — Each pleopod of first pair in the male operculum has its lateral margins parallel from rather near the base to the suddenly rounded end.

Length of a female with marsupium 3·2 mm., of a male 2·7 mm.

Remarks. *D. gracilipes* is allied to *D. simile*, but it is considerably larger; fifth joint of first pair of legs has five setæ, that of second pair eight setæ along the lower margin, and the female differs, besides, from that of *D. simile* in having the epimera much less produced, and the anterior angles of fifth thoracic segment rounded. — In the male specimen the antennulæ are 6-jointed, consequently the flagellum 3-jointed.

Occurrence. Taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 5 spec. (1 ♂).

— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 1 spec.

72. **Desmosoma politum** n. sp.

(Pl. X, figs. 8 a—8 e).

Female. First thoracic segment conspicuously broader and a little longer than the second, and as long as the fourth. Epimera at first segment constitute a pair of low, obtuse triangles; the three following pairs have the outer margin distinctly incised near the middle, and the front half a little protruding and rounded. Fifth segment a little more than half as broad again as long, with all angles broadly rounded, and the lateral margins a little converging backwards.

First pair of legs (fig. 8 b) very robust; fifth joint scarcely twice as long as deep, with four moderately strong spines on the lower margin, the most distal placed on the angle and much shorter than sixth joint, while a moderately short spine — thus the fifth — is placed above the longest spine on the terminal margin of the joint; sixth joint a little shorter than the fifth, very oblong-oval, somewhat less than three times as long as deep. — Second pair of legs (fig. 8 c) moderately strong; fifth joint long, between four and three and a half times as long as deep, increasing conspicuously in depth from the base to beyond the middle; its lower margin and end with seven spines, the five proximal of very moderate length, the sixth spine long and placed on the distal angle, while the seventh, inserted above the sixth on the terminal margin, is still longer, not much shorter than sixth joint; the upper margin with three strong setæ. Sixth joint with three strong setæ on the upper and a fine seta at the middle of the lower margin. — Seventh pair of legs (fig. 8 d) somewhat strong; fifth joint with a very long seta at the lower distal angle, and before this two much shorter setæ; sixth joint longer and especially more robust than in the preceding forms, with two somewhat short setæ on the lower margin, and three setæ, one among them long and stiff, on the upper margin; seventh joint unusually short, terminating in a well developed claw somewhat shorter than the joint.

Abdomen (figs. 8 a and 8 c) a little longer than broad; the lateral margins converge somewhat backwards to the postero-lateral teeth, which are small, directed mainly backwards and placed considerably before the end of abdomen, as the posterior margin is very convex. — Uropods somewhat less than half as long as abdomen, rather distant from the median line; peduncle somewhat thicker than the endopod; exopod minute, very thin and only about as long as the diameter of the endopod.

Length of a large female without marsupium 2·2 mm.

Remarks. *D. politum* is allied to *D. coarctatum* (Hansen, MS.) G. O. Sars, but the latter is separated from it by a very different shape of fifth thoracic segment, and in having only three spines on the lower margin and no spine on the terminal margin of fifth joint of first pair of legs. *D. politum* is, besides, closely allied to *D. armatum* G. O. Sars, which, however, differs from it especially in having the first pair of epimera produced into somewhat long, oblong-triangular, acute processes, in having no exopod on the uropods, and in some further particulars.

A very small specimen (from Stat. 90) with seventh pair of legs still wanting shows the curious feature that fifth joint of first pair of legs possesses only the long spine on the distal lower angle and no further spine at the lower margin, thereby being rather similar to the same joint in *D. insigne* n. sp. and *D. plebejum* n. sp. But it is instantly separated from these species in having the distal lower angle of the joint mentioned broadly rounded, while in the two species named this angle is produced as a kind of foot for the very long spine.

Occurrence. Taken by the "Ingolf" at two stations in the warm area.

West of Iceland: Stat. 90: Lat. 64°45′ N., Long. 29°06′ W., 568 fath., temp. 4·4°; 9 spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 3 spec. (1 very young).

73. **Desmosoma natator** n. sp.

(Pl. XI, figs. 2 a—2 e).

Male. The upper surface of the body reticulate, nearly looking as if covered with very small, more or less rounded scales set close together but never overlapping each other. — Head large, long and broad. First thoracic segment broader and a little longer than the second, but scarcely as long as the fourth. All epimera have their anterior section produced forwards and outwards into very conspicuous, though moderately short, triangular processes, decreasing a little in length from first to fourth pair; the two anterior pairs are nearly as long as broad, and all pairs have the narrow end terminating in a small but very distinct spine. Fifth segment anteriorly considerably broader than long, with the front margin straight and long, the lateral margins considerably concave, the anterior angles produced outwards, and their narrow end terminating in an outstanding spine.

First pair of legs (fig. 2 b) very robust; fourth joint on the upper distal angle with two very stiff setæ or thin spines, and one of them nearly as long as the next joint. Fifth joint not fully twice as long as deep; its lower margin and end with four spines in all; the spine on the distal angle long, though a good deal shorter than sixth joint; the spine just above the angle and the two other more proximal spines moderately long. Sixth joint scarcely shorter than the fifth, not quite two and a half times as long as deep. — Second pair of legs robust (fig. 2 c); fifth joint three times as long as deep, increasing conspicuously in depth from the base to the end, with three spines along the upper and six spines on the lower margin and the end; the first of these latter spines is very short, while the two distal spines, and especially the most distal, are long and moderately thick. Sixth joint with three spines along the distal half of the lower margin. — Seventh pair (fig. 2 d) have the distal half peculiarly developed; fifth joint is somewhat long and rather strong, with about three stiff setæ on the lower margin, while the median part of the upper margin has about six long, fine hairs; sixth joint is uncommonly strong and even a little longer than the fifth, with about four long, fine setæ on the lower margin, and about thirteen extremely long, fine setæ or hairs along the upper margin; seventh joint moderately long, slender, a little curved and terminating in a slender, somewhat long claw. — Fifth and sixth pairs rather similar to seventh pair, and especially their sixth joint possesses the same setæ along both margins.

Abdomen somewhat broad (as generally in males of this genus), a little longer than broad (fig. 2 a), tapering a little in breadth from somewhat from the base to near the postero-lateral processes (fig. 2 e), which are moderately large, triangular, acute, directed backwards and somewhat outwards; the posterior margin moderately convex. — The median lamella of the operculum tapers conspicuously from rather near the base to a little from the end, where each outer margin turns suddenly considerably outwards, so that the short terminal part is a little expanded, and the posterior margin of each pleopod is oblique. — Uropods (fig. 2 e) rather distant from the median line, somewhat less than half as long as the abdomen; basal joint somewhat triangular and moderately small; the exopod tiny, very slender, about as long as the diameter of the endopod.

Length of the single male 1·85 mm.

Remarks. This animal is easily distinguished by the shape of the epimera and the fifth segment, and by the legs. First and second pairs of legs are stronger than in *D. politum* and somewhat similar to those of *D. coarctatum* (Hansen MS.) G. O. S., but fifth joint of first pair has four spines in *D. natator*, only three in *D. coarctatum*. The development of the three posterior pairs of legs, above all the equipment of the upper margin of fifth and especially of sixth joint with very long, thin setæ, is hitherto unique in the genus *Desmosoma*, and these legs show a close resemblance to the corresponding legs in the males of *Nannoniscus simplex* n. sp., *N. oblongus* G. O. S., *N. analis* n. sp. or the female of *N. inermis*. I think that this equipment makes the legs adapted for swimming — hence the name *D. natator* — but it is of course impossible to know at present whether these setæ also occur in the female.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 1 spec.

74. **Desmosoma laterale** G. O. Sars.

(Pl. XI, figs. 3 a—3 e).

1899. *Eugerda lateralis* (Hansen MS.) G. O. Sars, Account, II, p. 254; Suppl. Pl. IV, fig. 1.

Female. Head (fig. 3 a—3 b) somewhat small; each lateral corner before the insertion of the antennula produced into a very conspicuous, oblong-triangular, acute process directed forwards and considerably outwards. — First thoracic segment narrower and somewhat longer than the second, which is scarcely as long as the fourth. Epimera well developed but not produced, having the margin of their anterior section evenly convex. Fifth segment considerably broader than long, subrectangular, with the lateral margins nearly parallel and all angles rounded.

First pair of legs (fig. 3 c) very robust. Fifth joint only half as long again as deep, with a single very strong spine beyond the middle of the lower margin, a strong seta near the distal end, and on the angle a very robust spine, which is as long as the joint. Sixth joint very large, considerably longer than the fifth, somewhat less than three times as long as deep. — Second pair of legs (fig. 3 d) uncommonly robust; fourth joint on the distal lower angle with a very thick spine slightly longer than the joint; fifth joint about twice as long as deep, with five or four spines along the lower margin and the end; the spines increase gradually and strongly in length from the first to the last, and if five are present the first is small, the others very strong; the two distal are distinctly curved, and the most distal, which is placed just above the angle, is as long as the sixth joint; the upper margin with three strong setæ. Sixth joint with three strong setæ on the upper and two on the lower margin. — Seventh pair (fig. 3 e) rather slender; fifth joint with five setæ on the lower margin and three of them extremely long; sixth joint with two setæ below.

Abdomen somewhat longer than broad, decreasing conspicuously in breadth from somewhat from the base to near the postero-lateral teeth, which are somewhat slender and situated rather far in front of the end of abdomen, as the posterior margin is extremely convex. — Uropods considerably less than half as long as the abdomen, rather remote from the median line; exopod between one-third and half as long as the endopod.

Length of the largest specimen, a female without marsupium, 2 mm.; a female with marsupium from Skager Rak is 1·8 mm.

Remarks. Specimens of this species had been separated by me among the "Ingolf" material and among material from Skager Rak, and I named them *D. laterale*. The three specimens from the last-named place were later handed over to G. O. Sars, who described and figured the species as *Eugerda lateralis*. But as Sars has overlooked the processes from the sides of the head, and as his figure of the entire animal is not as correct in some few particulars as usually is the case, I have drawn five figures and redescribed the species.

It may be pointed out that *D. laterale* is instantly distinguished from all other species of *Desmosoma* by the outstanding processes on the sides of the head, and by the armature of first pair of legs. In females without marsupium each of the four anterior segments has a long, subvertical spine in the median line of the ventral surface.

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

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 6 spec. (♀).

Distribution. The only earlier known locality is in Skager Rak, 15 sea-miles from the lighthouse of the Skaw, 125 fath., ooze.

75. **Desmosoma armatum** G. O. Sars.

(Pl. XI, fig. 4 a).

1864. *Desmosoma armatum* G. O. Sars, Forh. Vid. Selsk. Christiania for 1863, p. 216.
! 1897. — — G. O. Sars, Account, II, p. 126; Pl. 54, fig. 2.

The representation published by Sars is on the whole good, and quite sufficient for the recognition of the species. The shape of fifth and sixth joints in first and second pairs of legs and their equipment with spines and setæ afford good characters. Only a few features may be mentioned as additions or corrections.

The epimera of first thoracic segment are somewhat produced anteriorly, with the free inner or rather anterior margin concave, and the narrow end terminating in a robust, somewhat short spine. The epimera of second and third segments are slightly or scarcely produced forwards, but anteriorly angular with a minute hair. In my specimen and in a co-type of Sars I have found the seventh pair of legs (fig. 4 a) less slender than figured by that author; fifth joint has five setæ on the lower margin, three or four of them very long, and this joint has, besides, near the upper margin, five long hairs; sixth joint has four setæ on the lower margin, three of them long, and some setæ at or near the upper margin.

Length of the specimen from Greenland, a female with marsupium, 1·75 mm.

Remarks. In having no exopod on the uropods *D. armatum* agrees with the two following species, but differs strongly from both in the shape and spines of fifth joint of first pair of legs. As to spines and setæ on fifth and sixth joints of first and second pairs of legs, *D. armatum* is intermediate between *D. politum* and *D. coarctatum*, but it differs from both these forms and from *D. natator* in having no exopod on the uropods.

Occurrence. It has not been taken by the "Ingolf"; but in 1891 by the Ryder Expedition at the following place.

East Greenland: Danmark Ø, Lat. 70°27′ N.; 1 spec. (♀ with marsupium).

76. **Desmosoma insigne** n. sp.

(Pl. XI, figs. 5 a—5 g).

Female and Male. In the female the major part of the upper surface of the body seems to be reticulated, in reality set with a large number of partly long, extremely fine, sharp keels; these keels are mainly transverse on the middle of the head, on second to fourth segments, and on the posterior median part of the other segments, longitudinal on the head and on the more lateral parts of fifth (fig. 5 b) to seventh segment. In the male this adornment is much less developed, has vanished on large areas (fig. 5 c).

The head is somewhat narrow (fig. 5 a); the antennæ in the female rather short, in the male proportionately longer and much thickened. — First thoracic segment longer and a little narrower than the second, but about as long as the fourth. Fifth segment in the female (figs. 5 a and 5 b) broader than the preceding segments, slightly more than twice as broad as long in the median line, with the anterior margin somewhat concave, the lateral margins anteriorly convex, and near the middle a little concave, taken as a whole considerably converging backwards, with the keels on most of the surface very conspicuous; in the male this segment (fig. 5 c) is distinctly narrower than second or third segment, scarcely twice as broad as long in the median line, with the anterior part of the lateral margins feebly convex, their median part slightly concave, and the keels on the surface developed only towards the lateral margins. — Epimera subsimilar in both sexes; first to third pairs have their anterior section produced as triangles as long as or a little longer than broad, and terminating in spines, which are robust on first pair, thin on the two following pairs; fourth pair of epimera with the produced part quite small.

First pair of legs (fig. 5 d) with second to fourth joints robust, while the fifth joint is very thick; this joint has the lower distal part somewhat produced as a foot for the very long and robust spine, and its lower margin, which is a little less than twice as long as the depth of the joint, is slightly concave and without any spine, but with only a couple of short setæ and a moderately long seta just behind the base of the terminal spine. Sixth joint is slightly longer than the lower margin of fifth joint, and about three times as long as deep. — Second pair of legs (fig. 5 e) rather slender; fifth joint somewhat more than three times as long as deep, increasing a little in depth to beyond the middle, with about nine slender spines, gradually increasing in length, along the lower margin, and nine stiff setæ in an oblique row on the outer side; sixth joint with slender spines, the two distal very long, on the lower margin, and about four setæ on the outer side towards the upper margin. — Seventh pair (fig. 5 f) somewhat slender or moderately strong; fifth joint with four long setæ on the lower margin near its end; sixth joint with five or six long setæ along the distal half of the lower margin.

Abdomen (fig. 5 a) a little longer than broad, tapering considerably from near the base to the end, without postero-lateral teeth, and the posterior margin only a little convex. — Operculum in the female a little emarginate behind; in the male the pleopods of first pair have the lateral margins nearly parallel to the rounded end. — Uropods (fig. 5 g) inserted only a little from the lateral margins; they are more than half as long as the abdomen, with the peduncle twice as long as broad, considerably broader than, and a little more than half as long as, the slender endopod; exopod wanting.

Length of a female with marsupium 3·1 mm., of a male 1·85 mm.

Remarks. *D. insigne*, *D. plebejum* n. sp., and *D. chelatum* Stephensen constitute a group within the genus *Desmosoma*, as the distal joints of the first pair of legs form a kind of chela, the fifth joint being the hand, the strong spine answering to the immovable finger, while the sixth joint is the movable finger, and the hand has no spines on the lower margin. (A fourth species of this tribe is the antarctic *Eugerda longimana* Vanhöffen, as its first pair of legs have similar chelæ, but it differs from the three other species in possessing an exopod on the uropods, an additional proof that the presence or absence of the exopod is less than valueless as a generic difference between *Desmosoma* and *Eugerda*). It may be added that *D. chelatum* Stephensen, from off Elba in the Mediterranean, is considerably larger than *D. insigne*, as the type, a female with marsupium, is 4·4 mm. long; some characters between the two species are pointed out in the key (p. 109), and, besides, the second pair of legs in *D. chelatum* have fourteen spines on the lower margin and end of the fifth joint, and twelve spines on the corresponding margin of sixth joint. The most important differences between *D. insigne* and *D. plebejum* are pointed out in the key.

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

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1·5°; 6 spec. (3 ♀, 3 ♂).

77. **Desmosoma plebejum** n. sp.

(Pl. XI, figs. 6 a—6 d).

Female. The upper surface of the body without distinct lineal reticulation. — Head moderately small. — First thoracic segment shorter than the second, which is distinctly shorter than the fourth. Fifth segment conspicuously narrower at the anterior than at the posterior end, with the lateral margins somewhat diverging backwards and scarcely concave; the segment is not one-third as broad again as the length of its median line. — Epimera of first segment (fig. 6 a) anteriorly produced as a small, subtriangular process terminating in a distinct spine; the three other pairs of epimera have their anterior halves rounded in front.

First pair of legs (fig. 6 b) very robust. Second to fourth joints thicker than in *D. insigne*. Fifth joint very thick, with the distal lower part produced as a foot for the very long and robust spine, while its lower margin, which is scarcely half as long again as the depth of the joint, is straight and without spines, but with a seta at the terminal spine. Sixth joint proportionately considerably larger than in *D. insigne*, considerably longer than the lower margin of fifth joint, and conspicuously less than three times as long as deep. — (Second pair lost in my animals). — Seventh pair (fig. 6 c) somewhat strong; fifth joint rather broad, with five setæ on the lower margin.

Abdomen (fig. 6 a) somewhat longer than broad, ovate, without postero-lateral teeth. — Operculum small, scarcely half as long as the abdomen, about as broad as long, with the posterior margin rounded. — Uropods (fig. 6 d) inserted far from the median line, small, not one-third as long as the abdomen; peduncle oblong, about half as long as, and little broader than, the endopod; exopod wanting.

Length of a female with marsupium 1·65 mm.

Remarks. This small species is allied to *D. insigne*, but easily distinguished by several characters, some of them pointed out in the key (p. 109). It is in all probability confined to the cold area.

Occurrence. Taken by the "Ingolf" at two stations in the cold area.

East of Iceland: Stat. 102: Lat. 66°23' N., Long. 10°26' W., 750 fath., temp. ÷ 0·9°; 2 spec.

North-East of Iceland: Stat. 120: Lat. 67°29' N., Long. 11°32' W., 885 fath., temp. ÷ 1·0°; 1 spec.

Group X. Ilyarachnini.

Body moderately oblong or somewhat broad and thick. Head free and broad in proportion to length, without front area. Eyes wanting. Antennulæ terminal; first joint plate-shaped; flagellum frequently with several joints. Antennæ longer than the body, as the two distal joints of the peduncle are very elongate, and the flagellum has numerous joints; squama feebly developed or indistinct. Mandibles very thick and peculiarly shaped; the incisive part short and obtuse, movable lacina small or wanting, setæ short or wanting, molar process either rather slender, tapering to the obtuse, setiferous end, or very reduced, being a very thin and somewhat or very short process with terminal setæ. Palp of the maxillipeds with second joint long and broad, third joint short and broad, the two distal joints well developed; epipod broad, moderately long. — Thoracic segments movable, divided into two sections, and the three posterior segments very different from the four anterior ones. The two anterior pairs of legs somewhat prehensile, with second joint very long, considerably or much longer than the third; third and fourth pairs moderately or very long, with second joint short, while the third is extremely long. The three posterior pairs, at least fifth and sixth pairs, natatory; fifth joint compressed and expanded especially on fifth pair, sixth joint somewhat or scarcely expanded, and both these joints most frequently, and at least on fifth pair, equipped with natatory setæ along the upper margin or at both margins; seventh joint long. — Abdomen triangular, with the narrow end obtuse or acute. Uropods ventral, somewhat small; peduncle flattened, oblong-oval, with numerous marginal setæ; endopod much shorter than the peduncle, exopod minute or wanting.

Remarks. The family Munnopsidæ as limited by Sars in his Account can be divided into three very natural groups. All agree in having the antennæ elongate, at least third and fourth pairs of legs moderately to extremely long, and at least fifth and sixth pairs, generally also seventh pair, natatory, but they differ from each other in several characters, such as the position of the antennulæ, the shape and structure of the mandibles, the relative length of second and third joints in third and fourth pairs of legs, the posterior thoracic segments and the uropods. One feature is remarkable, viz. that while in the Ilyarachnini the third and fourth pairs of legs have the second joint short and the third extremely long, more than twice as long as the fourth, we find in the Eurycopini the second joint long, about as long as or much longer than the third, which is longer or shorter than the fourth, and in the Munnopsini both second, third and fourth joints in the same two pairs of legs short.

The group comprises four genera established by Sars, viz. *Ilyarachna*, *Echinozone*, *Aspidarachna* and *Pseudarachna*, but only the two first-named genera are represented in the material from the "Ingolf" area.

Ilyarachna G. O. Sars.

The generic characters have been well pointed out by Sars, excepting as to the antennulæ. He wrote in the Account (p. 134—135): "Superior antennæ originating close together from the front, basal joint large, sub-quadrangular in form, inner corner somewhat more projecting than the outer..." Sars figured his *I. denticulata* (Pl. 61) as having the inner distal corner of the basal joint of the antennulæ slightly produced and the outer corner strongly produced, which is correct, but opposed to his statement quoted. In *I. longicornis* G. O. S. and *I. hirticeps* G. O. S. he figured the outer corner of the same joint as slightly, the inner as strongly, produced, which is in accord with his generic diagnosis, but is in reality wrong; in all species of *Ilyarachna* the antennular basal joint has the portion outside the articulation of second joint produced into a very conspicuous, more or less triangular plate, while the distal inner corner is slightly or scarcely produced.

The antennal squama is feebly developed (Pl. XI, fig. 7 a, *sq.*; figs. 8 b and 9 b) or indistinct, it being a low protuberance on the outer side of third joint, and sometimes not marked off.

Sars paid no attention to the existence of epimeral plates or processes at the four anterior thoracic segments. For instance, his figure of the female *I. longicornis*, seen from above, shows the antero-lateral corners of the four segments a little produced and triangular, but according to my examination of specimens from Skager Rak the structure is in reality rather different, agreeing more with Tattersall's figure of his *Plunketti* Tatt. (Isopoda, Pl. VII). The first segment is at each side produced into a somewhat small, conical protuberance directed outwards, and with a single spine or two to four spines on the end; below and a little in front of this protuberance is seen a process, which originates from the basal joint of the leg, is directed obliquely outwards and more or less forwards, and terminates in a spine or in two to four spines. The epimera of second segment are broad, bilobed, the posterior lobe rounded, the anterior conical, directed obliquely forwards and terminating in a spine; the antero-lateral corner of the segment itself is produced into a kind of lobe which, seen from above, is narrow, directed forwards and outwards and, at least generally, without any spine. Third and fourth segments have their antero-lateral corners produced and shaped as in second segment, but not marked off by any suture as figured by Tattersall, while the epimera are rounded, without any spine. As *I. longicornis* G. O. S. is not known from the "Ingolf" area, it may perhaps be inserted here, that by the remarks on the anterior segments the two best characters between *I. longicornis* G. O. S. and *I. Plunketti* Tatt. have disappeared; the third character (Tattersall, op. cit. p. 29), derived from the apparently strong difference in the shape of first joint of the antennula, must be cancelled, as the figure of Sars (see above) is quite wrong as to this feature; the fourth character, derived from the shape of the female operculum, also disappears, as the upper (the basal) half of Sars' figure of the operculum is incorrect. Consequently *I. Plunketti* Tatt. must be cancelled as a synonym for *I. longicornis* G. O. S.

Of *Ilyarachna* as defined by Sars in the Account I have four species from our area, and three of them are new; a fifth species not seen by me, but described by Ohlin from East Greenland (and Spitzbergen), is mentioned later on. But it is with considerable hesitation that I follow Sars in adopting his genus *Echinozone,* which is so closely allied to *Ilyarachna* and based on two characters of so slight value (see later on) that it ought perhaps to have been withdrawn. My report here on *Ilyarachna* and *Echinozone* is unsatisfactory as to several points, because most of the specimens are mutilated, and of some species the material is very scanty. The single species, of which a rich material is to hand, showed furthermore much variation according to age, locality and, apparently, also variation of purely individual nature. Perhaps the first pair of male pleopods may afford reliable specific characters, when a good material of several species is studied.

78. **Ilyarachna hirticeps** G. O. Sars.

(Pl. XI, fig. 7 a).

1870. *Ilyarachna hirticeps* G. O. Sars, Forh. Vid. Selsk. Christiania for 1869, p. 167.
! 1897. — — G. O. Sars, Account, II, p. 137; Pl. 60.
! 1897. — *denticulata* G. O. Sars, op. cit. p. 138; Pl. 61, fig. 1.

According to Sars' figures of the animals from above, *I. hirticeps* and *I. denticulata* differ extremely in the armature with spines on the anterior margins of the four anterior thoracic segments, and must therefore be easy to separate. But the examination of a large material from numerous places showed that *I. denticulata* must be cancelled, as already stated by Ohlin (1901); I found specimens agreeing with *I. hirticeps* and others agreeing tolerably well with *I. denticulata*, but many specimens showed intermediate features, and neither depth nor temperature at the bottom seems to be of real influence on the development and character of the spines mentioned. Some particulars on the variation may be of interest.

The largest specimen, a female from the cold area ("Ingolf" Stat. 126, 293 fath.) is 10·5 mm. long; it has nearly thirty spines, many among than moderately large, along the front margin of second segment. A large specimen from Stat. 103 (579 fath., temp. ÷ 0·6°) has about twenty-two spines on the same margin, and in a small specimen, 3·4 mm. long, from the same station the marginal spines are much less numerous, though very conspicuous. In a specimen 6·2 mm. long from Stat. 139 (702 fath., temp. ÷ 0·6°) the spines on the margin of second segment are somewhat small and only twelve or fourteen, while the head is almost smooth; in a smaller specimen 4·5 mm. long, from the same station, the head is quite smooth and the marginal thoracic spines few and feebly developed. — My largest specimen from the warm area, a female from Stat. 24 (1199 fath., temp. 2·4°), is 8 mm. long, has nearly thirty well developed spines on the anterior margin of second segment, and is completely similar to large specimens from the cold area; another female, 7 mm. long, from Stat. 24 has only sixteen or eighteen spines along the same margin and several among them large; a third specimen, 4 mm. long, from the same station has six large spines on the same margin. In specimens 6--7 mm. long from south of Iceland (Lat. 63°15' N.) I find the anterior margin of the four segments extremely finely crenulate, the microscopic teeth being more numerous than according to Sars figure of *I. hirticeps*, and, besides, set with a small number of irregularly distributed, moderately strong spines, but probably some other spines have been broken off; in specimens 4·5—5 mm. long from the same place the fine crenulation is well developed, but no real spines are found, while the head has as usual numerous spines. In specimens 6—7 mm. long from another place in the warm area, viz. south-west of the Færoes in Lat. 61°15' N., the fine crenulation is very distinct, but scarcely any spine could be detected on the margins. — In very juvenile specimens, from 2·5 to 3 mm. or rarely nearly 4 mm., the spines on the head and spines or crenulation on the margins of the four anterior segments are sometimes partly or totally undeveloped.

All specimens, excepting the most juvenile, are distinguished from *I. dubia* n. sp. in having the head conspicuously broader than first segment, about as broad as, or frequently broader than, second thoracic segment. *I. hirticeps* is separated from *I. longicornis* G. O. S. (= *I. Plunketti* Tatt.) in having the basal joint of the antennulæ (fig. 7 a) armed with a few or several spines on the outer margin, and, besides, this joint is proportionately longer than in *I. longicornis*. (Above, on p. 121, it has been mentioned that in Sars' main figure of *I. denticulata* the basal joint of the antennulæ is correct, while it is wrong in his figures of *I. longicornis* and *I. hirticeps*.) Of *I. longicornis* one of the largest specimens is 4·7 mm., thus considerably larger than according to Sars, who said "about 3 mm."; adult specimens of this species are rather similar to specimens of the same size of *I. hirticeps*, but can be distinguished by first antennular joint and by having no spines on the head and no vestige of spines or crenulation on the front margins of the four anterior segments; small differences in the appendages may be derived from Sars' figures of both species. The shape of the proximal joints of the antennæ is also of some significance; their shape can be seen on fig. 7 a.

Occurrence. Captured by the "Ingolf" at four stations in the warm area, ten stations in the cold area and one station with lesser depth.

Davis Strait: Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3·6°; 3 spec.
— — Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3·8°; 5 spec.
— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 4 spec.
— — Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; ab. 16 spec.
North of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0·6°; 26 spec. (young).
— - - — Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; 2 spec.
East of Iceland: Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 6½ spec.
— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 7 spec.
— - — Stat. 101: Lat. 66°23′ N., Long. 12°05′ W., 537 fath., temp. ÷ 0·7°; 1 spec.
North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 3 spec.
— - — Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0·6°; 1 spec.
North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1·0°; 1 spec.
— - — Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath., temp. ÷ 1·0°; 4 spec.
South of Jan Mayen: Stat. 117: Lat. 69°13′ N., Long. 8°23′ W., 1003 fath., temp. ÷ 1·0°; 1 spec.
— - — — Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 1 spec.

Besides, *I. hirticeps* has been taken at nine places in our area. From Baffin Bay and Davis Strait it was recorded (by H. J. Hansen) from three localities, viz: Lat. 72°41′ N., Long. 59°50′ W., 227 fath.; Lat. 71°10′ N., Long. 58°56′ W., 199 fath., and Lat. 66°32′ N., Long. 55°34′ W., 100 fath. — North of Iceland it was secured by Admiral Wandel in the Skagestrand Bay, 119 fath., temp. 2·9°. The "Thor" has captured it at the following five places.

South of Iceland: Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; many spec.
— - — Lat. 63°5′ N., Long. 20°7′ W., 290 fath.; 1 spec.
— - — Lat. 62°11′ N., Long. 19°36′ W., 1010—1142 fath.; 2 spec.
South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 8 spec.
— - - — Lat. 61°7′ N., Long. 9°30′ W., 443 fath.; 9 spec.

Distribution. The "Thor" captured some specimens west of most southern Norway: Lat. 58°32′ N., Long. 4°18′ E., 148 fath. It has been taken along the coast of Norway from Stavanger Fjord to Vadsø in Varanger Fjord, 100 to 400 fath. (G. O. Sars). The Norwegian North-Atlantic Expedition has gathered it at three stations off the coast of Norway in the cold area in depths from 417 to 649 fath.; furthermore north-east of the Færoes in 1215 fath., temp. ÷ 1·2°; between Norway and Beeren Eiland, 191 fath., temp. 3·5°; west of Beeren Eiland, 658 fath., temp. ÷ 1·2°; finally at three stations near Spitzbergen, one with 1333 fath. and temp. ÷ 1·4°, another only 146 fath. and temp. 1·1°, while the third, with 260 fath., lies even so far northwards as in Lat. 80°3′ N. Ohlin also recorded it from Spitzbergen; two of his stations are off King Charles Island, one of them even so far eastward as Long. 29°39′ E., and the depths of only 32—37 fath. and 10 fath.

From these enumerations it is seen that this species goes down to 1199 fath. in the warm area, to 1333 fath. in the cold area, and that in high latitudes it has been taken in depths of 10 and of about 35 fath.

79. **Ilyarachna bicornis** n. sp.

(Pl. XI, figs. 8 a—8 c).

Female (without marsupium). Closely allied to *I. hirticeps*, but distinguished by a few features. — The head, which is about as broad as first thoracic segment (fig. 8 a), has its upper surface smooth, excepting that it possesses a single pair of conspicuous, robust, somewhat conical, acute protuberances or teeth, placed at some distance from the hind margin and considerably apart from one another. — The basal joint of the antennulæ (fig. 8 b) about as broad as the length of its inner margin, while the distal part outside the articulation of next joint is produced into a good-sized triangle terminating in a spine; the outer margin of the joint has no spines, but at most some short setæ. — The basal joint of the antennæ (fig. 8 b) is broad, with the outer corner considerably produced and terminating in a thick spine.

Second thoracic segment broader than the head and considerably broader than fifth segment (fig. 8 a). The four anterior segments with partly moderately small, partly very small spines along their anterior margins, about ten spines on the second and only a few on fourth segment; the shape of the sides of the four anterior segments and the epimera may be sufficiently seen on the figure. — The abdominal operculum has a high keel with many spines; the uropods without exopod.

Length of the largest specimen 8·7 mm.

Remarks. This species is certainly valid, not a variety of *I. hirticeps*: the curious armature of the head and the absence of spines on the outer margin of the basal antennular joint must be good characters.

Occurrence. Gathered by the "Ingolf" at a very deep station in the warm area.

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

80. **Ilyarachna dubia** n. sp.

(Pl. XI, figs. 9 a—9 c).

Female (without marsupium) and Male. Closely allied to *I. hirticeps*. — Head distinctly narrower than the first and somewhat narrower than second segment; its surface is completely smooth, without any trace of spines. — Basal joint of the antennulæ (fig. 9 b) scarcely as broad as the length of its inner margin, while the distal outer part is produced into a considerable or even rather long triangle terminating in a small spine and a feathered seta; the outer margin with at most a few thin, nearly setiform spines; in the female (fig. 9 b) the flagellum consists of five joints, the four distal very slender and moderately long, while in the male the flagellum is considerably thicker and longer, with about nineteen short joints. — The anterior margin of the four anterior thoracic segments without spines or distinct crenulation. The shape of the epimera may be seen on fig. 9 a. — The female operculum has a high keel with strong setæ; the uropods without exopod.

Length of the largest specimen, a female without marsupium, 3·8 mm., of a male 3 mm.

Remarks. It is after prolonged hesitation that I establish this species on the rather small specimens to hand. I was inclined to think that they were only less than half-grown specimens of *I. hirticeps* with the spines on the head and the spines or crenulation on the anterior thoracic segments still undeveloped. But the smooth and narrow head seems most probably to be a specific character, as most of my young specimens of *I. hirticeps* of the same size, or even a little smaller, have the head broad as in the adults, and in small specimens of *I. hirticeps* measuring 2·3—3 mm. from Stat. 138, and with the head nearly as narrow as in *I. dubia*, both the head itself and the thoracic segments have long spines. Furthermore, the fact that the male has the flagellum multiarticulate with well developed sensory filaments, seems to indicate that, though only 3 mm. long, it cannot be far from adult. But being, nevertheless, not quite sure, I choose to name the form *I. dubia* and must let the future decide its value.

Occurrence. Taken by the "Ingolf" at two stations in the cold area.

North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1·0°; 1 spec. (♀)

— - — Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath., temp. ÷ 1·0°; 2 spec. (♂ and ♀).

81. **Ilyarachna Bergendali** Ohlin.

1901. *Ilyarachna Bergendali* Ohlin, Bihang till K. Sv. Vet. Akad. Handl. Vol. 26, IV, No. 12, p. 37, figs. 8 a—8 d.

Of this species I have not seen any specimen. It has been established on three specimens, and wishing to examine some features I wrote to the Director of the department in question of the Riksmuseum in Stockholm, Dr. Hj. Théel, but he answered that the specimens could not be found, and after the death of Ohlin they were probably lost in one way or another. Consequently I can only make some remarks based on Ohlin's description and figures.

I. Bergendali is certainly a valid and even an interesting species, as the antennæ are much longer than in any other form from the North Atlantic; the penultimate joint of the peduncle is, according to Ohlin's fig 8 a, even a good deal longer than the whole body, and nearly half as long again as the following joint; if these joints are lost the species can be separated by having the proximal four-jointed part of the antennæ considerably larger than in the other forms of this genus. According to Ohlin's fig. 8 c the basal joint of the antennula has a somewhat aberrant shape; his fig. 8 d, representing the fifth thoracic leg, shows that the third joint is considerably thicker, the fifth joint narrower in proportion to length, and the seventh joint longer in proportion to the sixth than in *I. hirticeps*. The anterior margins of the four anterior segments are said to be crenulate, and the fifth segment "not at all emarginated behind", but the latter statement is somewhat astonishing.

Ohlin wrote: "Oral parts in no respect differing from those in *I. hirticeps*," but unfortunately he did not say plainly whether a mandibular palp was found or not. His text contains nothing on the uropods, and I am not sure that they do not possess an exopod. For these and other reasons *I. Bergendali* is mentioned later on in the remarks on *Echinozone arctica*.

Occurrence. Ohlin has mentioned a single specimen from East Greenland; it had been taken at Lat. 71°33′ N., Long. 21°30′ W., 106 fath.

Distribution. East Spitzbergen: King Charles Island, Lat. 78°50′ N., Long. 27°39′ E., 11 fath.; 2 spec. (Ohlin).

82. **Ilyarachna spinosissima** n. sp.

(Pl. XI, figs. 10 a—10 e; Pl. XII, figs. 1 a—1 c).

Male and Female (without marsupium). — Head nearly as broad as second thoracic segment; in the male (fig. 10 a) above with several subcylindrical processes and minute tubercles, each terminating in an articulated spine; four of the largest processes are placed in a row towards the posterior margin, and the third large pair a little from the antero-lateral margins; in the larger female the processes and tubercles are somewhat more numerous. — First joint of the antennulæ (fig. 10 a and 10 b) somewhat oblong, with a few strong spines on the outer margin; the outer distal part is produced somewhat forwards and terminates in a thick spine. — The body formed by the four proximal antennal joints taken together is considerably larger than in *I. hirticeps*, and has a few tubercles of very different size. — The mandibles have the palp well developed; the left mandible (fig. 10 c) possesses a somewhat small movable lacinia and some five short setæ, while the moderately small molar process tapers from near the base to the narrow, setiferous end. The maxillipeds (fig. 1 a) with second joint proportionately longer and the epipod larger than in *I. hirticeps*.

In the male (fig. 10 a) each of the four anterior thoracic segments has a pair of somewhat high processes a little from the front margin, one pair or two pairs of lateral processes, and the fourth segment, besides, a pair of processes near the submedian part of the hind margin; each of these processes is truncate with a terminal spine; fifth and sixth segments each with a larger number of processes and small tubercles on the surface and the lateral margins; the small seventh segment (fig. 10 a and 1 b) has two dorsal processes and a spine on each lateral angle. In the female, which is much larger than the male specimen, the same processes and tubercles are found on the segments and, besides, a good number of tubercles. — Fifth pair of legs (fig. 10 e) differ much from those in *I. hirticeps*; fifth joint is very moderately expanded, about two and a half times as long as broad, and with natatory setæ only on the upper margin, while the opposite margin has some spines, three of which, on the proximal third, long and strong; sixth joint is not expanded and without real natatory setæ.

Abdomen (fig. 1 b) oblong-triangular as in the preceding forms, but the proximal half of its lateral margins has some protuberances, all probably terminating in spines; the upper surface has several moderately small or quite small tubercles almost regularly arranged on its median area and towards the lateral margins. — Operculum in the female without any conspicuous keel. — Uropods (fig. 1 c) with the endopod somewhat long and no exopod.

Length of the female without marsupium 6 mm., of the male 3·8 mm.

Remarks. *I. spinosissima* is instantly separated from all other species of the genus by the numerous processes and tubercles on the surface of the body. The mandibular palps and the absence of the exopod on the uropods shows it to belong to this genus.

Occurrence. Taken by the "Ingolf" at two of its deepest stations in the warm area.

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 spec. (♂, ♀).

South of Davis Strait: Stat. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fath., temp. 1·3°; 1 spec.

Echinozone G. O. Sars.

Among the generic characters pointed out by Sars two would at first sight seem to be of some importance, viz. that the mandibles have no palp and that the uropods are biramous. Sars established the genus on a single species previously described by him as *Ilyarachna coronata*, which is conspicuously thicker than the other forms of *Ilyarachna* and adorned with larger spiniform processes on the front margin of the four anterior segments. But characters drawn from the relative breadth of the body and the armature cannot be used in the diagnosis of the genus *Echinozone*, as I have a new species, which has the body as slender as *Ilyarachna* and no armature on the anterior segments, but agrees with *E. coronata* and differs from *Ilyarachna* in the two features especially pointed out by Sars, viz. no mandibular palps and biramous uropods. Under these circumstances the genus *Echinozone* seems to me to be of very slight value, ought perhaps to be cancelled, and the same is the case with the genus *Aspidarachna* G. O. S. But I have not withdrawn these two genera, because, still, we certainly know too few of the species belonging to or allied to *Ilyarachna*.

83. **Echinozone coronata** G. O. Sars.

1870. *Ilyarachna coronata* G. O. Sars, Forh. Vid. Selsk. Christiania for 1869, p. 168.
! 1897. *Echinozone* — G. O. Sars, Account, II, p. 139; Pl. 61, fig. 2.

The specimens to hand agree, on the whole, well with Sars' figure as to the length and arrangement of the thoracic dorsal processes. Only two fine and large specimens, both from the "Ingolf" Stat. 35, show a marked difference. In normal specimens short denticles alternate with long and robust spiniform processes on the front margins of the four anterior segments, but in the two specimens mentioned most of the denticles are spiniform and much longer than usual, being half or conspicuously more than half of the long processes. The largest of these specimens is 5 mm. long, thus agreeing with the length stated by Sars.

Occurrence. Captured by the "Ingolf" at four stations in the warm area.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 1 spec.

— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3·6°; 3 spec.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 6½ spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 3 spec.

Furthermore, it has been secured by the "Thor" at a single place.

South of Iceland: Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; 1 spec.

Distribution. A specimen was taken by Cand. mag. Ad. Jensen (in "Michael Sars") between Shetland and Norway: Lat. 60°57′ N., Long. 3°42′ E., 190 fath. Otherwise it is known only from places at the west coast of Norway and at Vadsö in the Varanger Fjord, 100—300 fath. (G. O. Sars).

84. **Echinozone arctica** n. sp.

(Pl. XII, figs. 2 a—2 c).

Male (probably not full-grown). — Body nearly as slender as in *Ilyarachna*. Head broader than the first but narrower than the second thoracic segment, with the surface smooth. — Basal joint of the antennulæ (fig. 2 b) very oblong, with the inner margin only a little less than twice as long as the breadth of the joint; the outer margin somewhat convex without spines; the outer distal part produced into an oblong process, which has a feathered seta but no spine on the obtuse end. — The four proximal joints of the antennal peduncle constitute together a large body, much larger than in any species of *Ilyarachna* or *Echinozone* seen by me, and as long as the sum of the head and the two anterior thoracic segments; in all probability the two distal joints of the peduncle have been strong and extremely long. — Mandibular palps seem to be entirely wanting; left mandible without movable lacinia or setæ.

The four anterior thoracic segments without spines or crenulation on their front margin. The specimen to hand shows the third segment conspicuously broader than the second, but whether this may be quite normal is impossible to decide. Fifth segment considerably narrower and a good deal shorter than the fourth; the posterior margin of both fifth and sixth segments very concave. The three posterior segments with a conspicuous, rounded tubercle in the median line. – (All pairs of thoracic legs have been well developed, but are lost, excepting their two proximal joints).

Abdomen with a rounded tubercle in the median line somewhat from the base. – Uropods (fig. 2 c) biramous; the endopod is somewhat robust; the exopod (*ex*) small but distinct.

Length of the single male 2·2 mm.

Remarks. In the large size of the proximal 4-jointed part of the antennæ and to a lesser degree in the shape of the basal joint of the antennulæ *E. arctica* shows more affinity to *Ilyarachna Bergendali* Ohlin than to any other species of the two genera in question. And therefore I think it not improbable that *I. Bergendali* in reality ought to be referred to *Echinozone*. But as the differences in the thoracic segments between *I. Bergendali* and *E. arctica* are so strong both as to shape — especially of the fifth segment — and to armature, both must be valid species.

Occurrence. Not taken by the "Ingolf". — The IInd Amdrup Expedition captured the single male described at Jan Mayen, 55 fath.

Group XI. Eurycopini.

Body much varying in shape, rarely slender, generally moderately oblong or rather broad. Head free, of moderate or very considerable breadth. Eyes wanting. Antennulæ dorsal with first joint plate-shaped, excepting in *Syneurycope*; flagellum with several to numerous joints. Antennæ somewhat to very much longer than the body (in *Syneurycope* only the proximal part known), as the two distal joints of the peduncle are considerably or extremely elongate, and the flagellum has numerous joints; squama wanting or well developed. Mandibles most frequently mainly as in the Ianirini, but the molar process distinctly shorter with the end more obliquely cut off; in *Munnopsurus* their distal parts are extremely reduced or wanting, and the molar process is a broad, large, rounded tubercle (see later on); palp well developed. Maxillipeds in the main as in the Ianirini; epipod moderately or very large. — Thoracic segments divided into two sections; the four anterior segments movable; the three posterior segments very different from the four anterior, and frequently either only fifth and sixth or all three immovably coalesced. First pair of legs distinctly prehensile or very slender and then at most feebly prehensile; second pair more similar to third than to first pair, and generally very similar to third pair, though always distinctly shorter; third and fourth pairs moderately to extremely long, with second joint long, about as long as or much longer than the third. The three posterior pairs natatory; fifth and sixth joints more or less expanded with marginal setæ; seventh joint always distinct, frequently long. Uropods ventral, biramous; peduncle oblong or thick, but not lamellar and without any row of setæ on the lateral margin.

Remarks. This group comprises four northern genera: *Syneurycope* n. gen., *Storthyngura* Vanhöffen, *Munnopsurus* Richardson and *Eurycope* G. O. Sars, while a fifth genus, *Munneurycope* Stephensen, is cancelled and its species referred to *Eurycope*. The most interesting differences between this group, the Ilyarachnini and the Munnopsini are found in the second to fourth pair of legs. Other differences are found in the antennulæ, the mandibles, the uropods, etc.

Syneurycope n. gen.

Description. Body very slender. — Head without any front area marked off by keels. — Antennulæ (figs. 4 a–4 c) placed at the front end of the head only a little from one another and very peculiar; first joint subcylindrical; second joint much longer than the first and attached to its end; third joint very much longer than the second and longer than the flagellum. — Antennæ lost excepting the four proximal joints (fig. 4 d); third joint a little longer than broad or deep, without squama; fourth joint cylindrical and as long as the third. — Left mandible (fig. 4 e) about as in the Ianirini, having the incisive part, the movable lacinia, some setæ and the cylindrical, strong, at the end obliquely cut molar process well developed; third joint of the palp only feebly expanded at the middle. — Maxillipeds (fig. 4 f) with fourth and fifth joints much expanded, but yet narrower than second joint; sixth joint without any produced lobe; epipod extremely large.

The four anterior thoracic segments movable, while the three posterior segments are immovably fused. Epimera not developed, as the first joint of each leg is rounded, not plate-shaped or produced in any process. — First pair of legs (figs. 4 h and 4 i) moderately slender, prehensile; second joint long, much longer than the third, which is as long as the fifth and slightly longer than the sixth; fifth joint with a few spines on the lower margin. Second pair (fig. 4 k) as to length intermediate between first and third pairs; second joint about as long as in first pair, a little longer than fifth joint, which is a little longer than the sixth; third joint somewhat shorter than the second and slightly longer than the fourth; seventh joint nearly longer than the fourth, and the claw is distinct though very small. — Third and fourth pairs considerably longer than the body, with fifth and especially sixth joint very elongate; second joint long, longer than the third, which is much shorter than the fourth. — The three posterior natatory pairs uncommonly narrow (figs. 4 a, 4 l and 4 n), decreasing a little in length and considerably in breadth from fifth to seventh pair; fifth pair has the fifth joint nearly three times as long as broad and a little broader than the sixth, and both these joints have a moderate number of natatory setæ along both margins, while in the two posterior pairs these two joints are narrower with fewer setæ; sixth joint in all three pairs with a long, stiff, nearly spiniform seta just below the insertion of seventh joint (fig. 4 m), which is long, more or less compressed, with the minute claw at the end.

Abdomen (figs. 4 a and 4 b) has a very short basal segment, and the articulations in front of and behind this segment are probably slightly movable. Abdomen posteriorly much produced, with a somewhat long, narrow portion; the uropods small, biramous (fig. 4 o).

Remarks. This genus is more allied to *Storthyngura* than to the other genera, agreeing with it in having the three posterior segments coalesced. As in *Eurycope* and *Storthyngura* the mandibles have all parts well developed. But in *Syneurycope* the body and the three posterior pairs of legs are much more slender than in the other genera, and fourth joint in third and fourth pairs of legs is much longer than third joint. The peduncle of the antennæ differs especially in length and shape of fourth joint, while the antennular peduncles differ greatly from those in all other genera of this group or of the two other allied groups.

Only a single species is known.

85. **Syneurycope parallela** n. sp.

(Pl. XII, figs. 4 a—4 o).

Male. Very slender, more than five times as long as the breadth of fourth thoracic segment, very moderately depressed. Each of the four anterior segments and especially the head with the median dorsal area raised and irregularly sculptured. — Antennulæ (fig. 4 c) not fully half as long as the body; first joint considerably longer than deep; second joint more slender than the first and about half as long again as that joint; third joint slightly shorter than the sum of the two preceding joints, and a little longer than the flagellum, which consists of about 16 joints. Maxillipeds (fig. 4 f) have the inner margin of fifth joint armed with a number of irregular, spiniform teeth (fig. 4 g).

First pair of thoracic legs (figs. 4 h and 4 i) with three vertical spines on the lower margin of fifth joint. Second pair (fig. 4 k) with many very short spines on the lower margin of fifth, sixth and the distal part of fourth joint. Third and fourth pairs without spines along the margin of fourth to sixth joint; fourth pair a little more than half as long again as the body.

Abdomen a little shorter than the three posterior thoracic segments combined (fig. 4 b), considerably more than half as long again as broad, being much produced backwards, with the posterior half narrow and terminating in an acute angle. — The operculum could not be examined; it is very far from reaching the end of the abdomen. — The uropods (fig. 4 b and 4 o) small; the exopod (*ex*) minute, while the endopod is about as long as the very oblong peduncle.

Length 3·7 mm.

Remarks. This species is distinguished by many features from all other forms of natatory Asellota hitherto known. It may, however, be possible that later, if more forms of the genus are discovered, some of the characters in the description of the genus will have to be considered only of specific value.

Occurrence. Taken at a very deep station in the warm area.

South-West of Cape Farewell: Stat. 22: Lat. 58°10′ N., Long. 48°25′ W., 1845 fath., temp. 1·4°; 1 spec.

As the specimen is unusually well preserved it has perhaps been taken from the meshes of the trawl, and may possibly be pelagic not too far from the bottom.

Storthyngura Vanhöffen.

Vanhöffen wrote (1914) that he established this new genus for the forms of *Eurycope* "mit zackigem Abdomen, welche auf dem Körper mehr or weniger bedornt sind", while he left in the old genus all the species with the abdomen rounded. He enumerated eight species as belonging to *Storthyngura*, viz. *S. intermedia* Bedd., *S. fragilis* Bedd., *S. atlantica* Bedd., *S. novæ-zealandiæ* Bedd., *S. caribbea* Benedict, *S. truncata* Richardson, *S. magnispinis* Richardson and *S. elegans* Vanhöffen. He overlooked my description and figures of *Eurycope pulchra* H. J. H. (1897), as this species is well armed with processes and must be referred to *Storthyngura*.

The existence of processes on thorax and abdomen is a very practical character, but if no other features could be found, the genus would seem to be of slight value. I have seen only two of the species enumerated, viz. *S. pulchra* H. J. H. and *S. magnispinis* Rich., but these species show some characters which can be considered of generic value if they also are found in the other forms, which probably is the case. In both species the antennal squama is not set off by an articulation. The three posterior thoracic segments, though well marked off in *S. pulchra*, are immovably coalesced, while the articulation between thorax and abdomen allows in *S. magnispinis* a quite feeble and in *S. pulchra* no movement. The natatory legs have the fifth joint at least almost twice as long as broad, thus less expanded than in *Eurycope*, and the median lamella of the male operculum has its central part conspicuously narrower than the more distal portion.

Only a single species is known from our area.

86. Storthyngura magnispinis Richardson.

(Pl. XII, figs. 3 a—3 n).

1908. *Eurycope magnispinis* Richardson, Proc. U. S. Nat. Mus. Vol. XXXV, p. 84, fig. 21.

Description. Body rather oblong, moderately convex. — Head (fig. 3 b) without dorsal keels or any limited front area; somewhat before the posterior margin a pair of broad and low, circular protuberances. — Antennulæ considerably less than half as long as the body, in the main as in *Eurycope*, inserted on the dorsal surface of the head not far from one another; first joint depressed, about half as long again as broad, with the antero-interior angle produced into a conspicuous subconical process, while the distal outer, somewhat broad part is considerably produced and broadly rounded, so that the second joint, which is rather small and about as long as broad, is placed on the distal upper surface of first joint; third joint slender and about as long as the second; the flagellum with numerous joints. — The antennæ somewhat more than twice as long as the body. Third joint of the peduncle (fig. 3 b) large, with the inner distal corner produced into a rather long and robust process directed forwards and inwards; the squama is not marked off by any suture and is shaped as a subconical tubercle; fourth joint about as long as broad. — Left mandible (fig. 3 c) with the incisive part, the movable lacinia and the setæ well developed; the molar process is of moderate length, very thick at the base and tapering much to the end, which is cut off obliquely. Maxillipeds (fig. 3 d) moderately broad; fifth joint very broad and slightly broader than the fourth; sixth joint with a somewhat small lobe; epipod more than twice as long as broad, with the distal half of the outer margin concave, and a protruding obtuse angle at the middle of that margin.

First thoracic segment (fig. 3 a) has a small median process at the front margin, while each antero-lateral corner is produced in a robust and moderately long process directed outwards and much forwards. The three following segments each with a median process directed upwards and forwards; each antero-lateral corner is produced into a slender, moderately small process, and behind this process is seen the epimeron, which is bifid, with its anterior part produced into a long and a little curved process directed forwards and outwards, and its posterior part produced into a tooth. — The three posterior segments are, as already stated, dorsally fused, so that no suture but only an impression is seen on the broad median part; each segment has a pair of short dorsal processes, and the side is produced into a long, on fifth and sixth segments even very long, process. The dorsal processes on all thoracic segments are conspicuously longer in the male than in the female, while sexual difference is on the whole less developed in the lateral processes. — The articulation between thorax and abdomen allows a feeble movement.

The four anterior pairs of legs (figs. 3 e, 3 f and 3 g) in the main as in some smaller species of *Eurycope*; third (fig. 3 g) and fourth pairs subsimilar in length and scarcely as long as the body. Second to fourth pair yet more robust than in *Eurycope*, with sixth joint increasing considerably in depth from base to end, and armed on the lower margin with a moderate number of strong spines; seventh joint uncommonly long, about two-thirds or more as long as the sixth. — The three posterior pairs (figs. 3 h and 3 i) have the fifth joint about three times as long as broad, and almost the proximal half of the lower margin without setæ; sixth joint nearly as long as the fifth, but conspicuously more narrow and closely set with setæ along most of both margins; seventh joint — with the claw not marked off — about three-fourths as long as sixth joint.

Abdomen without any short basal segment; on the surface it has a median vertical tubercle near the base and a pair of submedian minute tubercles behind the middle, on each side a long basal process and a similar process behind the middle; the posterior part is a little produced but broad, with the hind margin straight or slightly concave, and each lateral margin of the produced part is convex and serrate (fig. 3 k). — The female operculum (fig. 3 k) nearly as long as broad, with the posterior half of the margin semicircular. In the male the operculum (fig. 3 l) is somewhat longer than broad; the median lamella with the major part of the lateral margins considerably concave, as each pleopod tapers from the moderately broad basal part to near the middle, then is gradually widened to somewhat from the end and finally tapers to the end, which has the outer corner produced as a triangular protuberance, and the hind margin of the lamella is consequently somewhat incised (fig. 3 m).

the second pair of pleopods (fig. 3 n) have the distal part somewhat produced, moderately broad and rounded; the copulatory organ is somewhat slender, with the distal fourth filiform and reaching a little beyond the end of the pleopod. — The outer branch of the penultimate pair of pleopods is narrow. — Uropods (fig. 3 k) in both sexes of very moderate size; the peduncle is slender and about as long as the endopod, which is somewhat longer than the thinner exopod.

Length of a female with marsupium 4·2 mm., of a large male 3·7 mm.

Occurrence. Taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 6 spec.

— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 7 spec.

Distribution. The type, hitherto the only specimen recorded, was taken by the "Albatross" at Lat. 39°49′ N., Long. 68°28½′ W., 1467 fath., temp. 3·15° (Richardson).

Munnopsurus Richardson.

In 1912 Harriet Richardson published a small paper containing only the description of *Munnopsurus arcticus*, n. gen., n. sp., from Novaya Zemlya. This form is *Eurycope gigantea* G. O. Sars, but while Richardson's name for the species consequently must be cancelled, the genus may be accepted. To the same genus *Eurycope longipes* Tatt. must be referred; that *Eurycope gigantea* G. O. S. forma *australis* Vanhöffen from the antarctic deep-sea is a third species can be considered as certain, but Vanhöffen's statements and figures (1914) are too imperfect for closer comparison.

In *Eurycope* the mandibles have the incisive part and the movable lacinia (on the left mandible) well developed, and generally a row of setæ, rarely a single seta; the molar process is considerably protruding, rather well defined and its end cut off (comp. figures in Sars' Account). In the two northern species of *Munnopsurus* the incisive part is simple with a single tooth or none, the movable lacinia and the row of setæ completely wanting, while the molar process is shaped as a broad, large tubercle with the end rounded and bearing a small bundle of stiff setæ (Pl. XII, fig. 6 a, and, besides, figs. 3 c and 3 d on Pl. XX in "Dijmphna-Togtets zool.-bot. Udbytte", 1887). In no form hitherto studied mandibles intermediate between those in *Eurycope* and *Munnopsurus* have been found, and therefore the genus *Munnopsurus* must at least provisionally be considered as valid, though in all other characters it is closely allied to *Eurycope*, in that the antenna have a distinct squama well marked off, that all thoracic segments are movable, that second joint of second to fourth pair of legs are long, longer than the third joint, and that second pair is very similar to third pair.

The name *Munnopsurus* is unfortunately badly chosen, as its species are related to *Eurycope* and not to *Munnopsis*, from which they differ much, not only in general aspect but in having second pair of legs nearly similar to third pair (in *Munnopsis* second pair is prehensile, similar to first and very different from third pair), in having second joint of third and fourth pairs of legs long, in the posterior thoracic segments, uropods, etc.

The two above-named northern species are represented in the material.

87. **Munnopsurus giganteus** G. O. Sars.
(Pl. XII, fig. 5 a).

1877. *Eurycope gigantea* G. O. Sars, Arch. f. Math. og Naturv. Vol. II, p. 353.
! 1885. — — G. O. Sars, North-Atl. Exp. p. 130; Pl. XI, figs. 1—25.
! 1887. — — H. J. Hansen, Dijmphna-Togtets zool.-bot. Udbytte, p. 198; Pl. XX, figs. 3—3 m.
1912. *Munnopsurus arcticus* Richardson, Bull. l'Inst. Océan. Monaco, No. 227.

The differences between this species and *M. longipes* are pointed out in the notes on the latter form.

There is scarcely more than a single point to add to the accounts given by Sars and myself. But that point is a morphological observation of interest. Fig. 5 a represents the proximal parts of the left maxilliped seen from below and attached to its sternite (*st*). The small transverse plate, *pcx*, is the hitherto undiscovered præcoxa of the maxillipeds, placed between the sternite (*st*) and the coxal joint, *cx*, generally considered as the first joint. The piece marked *bas* is the proximal part of the "basis", generally described as the second, long joint of the maxillipeds. So much may be said here; the whole morphological question has been dealt with on p. 9. — It may be noted here that the exopod of fourth pair of pleopods is rather broad, lamellar, with the end obtuse.

Among the large material seen by me I have found only a single female with the marsupium fully developed; this female, from the Kara Sea, is 33 mm. long; the general size of the male is 24—25 mm.

Occurrence. Taken by the "Ingolf" at seven stations, all in the cold area.

North of the Færoes: Stat. 140: Lat. 63°29′ N., Long. 6°57′ W., 780 fath., temp. ÷ 0·9°; 2 spec.
— - - — Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0·6°; 4 spec.
East of Iceland: Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 1 spec.
— - — Stat. 101: Lat. 66°23′ N., Long. 12°05′ W., 537 fath., temp. ÷ 0·7°; 10 spec.
North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 4 spec.
— - — Stat. 124: Lat. 67°40′ N., Long. 15°40′ W., 495 fath., temp. ÷ 0·6°; 2 spec.
South of Jan Mayen: Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 1 spec.

It has been taken in Denmark Strait off East Greenland at Lat. 66°42′ N., Long. 26°40′ W., 292 fath., temp. ÷ 0·11° (Grieg), and east of Iceland: Lat. 64°53′ N., Long 10°00′ W. (Grieg).

Distribution. Taken by Admiral Wandel a little south-east of the Færoes: Lat. 61°23′ N., Long. 4°21′ W., 505 fath., temp. ÷ 0·4°, 1 spec. It was recorded from the Færoe Channel, 540 fath. (Norman) and from a place north-east of the Færoes: Lat. 63°06′ N., Long. 2°46′ W., 483 fath., temp. ÷ 1·07° (Grieg). Sars recorded it from three stations in the cold area west of Norway, 350 to 634 fath., from two places in the cold area west and south-west of Beeren Eiland, 447 and 658 fath., finally from two places north-west of Spitzbergen, respectively 459 fath., temp. ÷ 1·0°, and Lat. 80°3′ N., 260 fath., temp. ÷ 1·1°. Furthermore recorded from King Charles Island, East Spitzbergen, 32—37 fath. (Ohlin), from near Beeren Eiland, 40 fath. (Hoek), from Novaya Zemlya (Richardson), and it is very common in the Kara Sea, 20—100 fath. (several authors).

That I consider *M. giganteus* forma *australis* Vanhöffen from the antarctic deep-sea as a different species is already mentioned.

88. **Munnopsurus longipes** Tattersall.

(Pl. XII, figs. 6 a—6 b).

1905. *Eurycope longipes* Tattersall, Isopoda, p. 30 and 75; Pl. X, figs. 1—8.

Tattersall has published an elaborate decription with figures of this species. He also pointed out differences between it and *M. giganteus*, but some points may be added, and a view of the main differences may be useful. Of *M. longipes* I have only a single adult specimen, a male, but there is probably no sexual difference worth mentioning in any organ excepting the abdominal operculum.

In *M. giganteus* the antennulæ are less than half, in *M. longipes* considerably more than half, as long as the body. In *M. giganteus* the first pair of legs, when stretched backwards, do not reach the middle of the abdominal operculum; their second joint is about as long as the sum of fifth and sixth thoracic segments and somewhat shorter than fifth joint, which is conspicuously thicker towards the base than at the end, and at least twice as long as the sixth; in *M. longipes* this pair are conspicuously more slender and reach to the posterior end of the abdomen, while their second joint is very conspicuously longer than the sum of fifth and sixth thoracic segments, and only a little shorter than, or as long as, fifth joint, which is scarcely thicker at the base than near the distal end, and considerably less than twice as long as the sixth. — In *M. giganteus* the abdomen is broader than long, and as long as the three posterior thoracic segments combined; in *M. longipes* it is produced backwards, somewhat longer than broad, and conspicuously longer than the three posterior thoracic segments combined. — In *M. giganteus* the median lamella of the male operculum tapers feebly near the end, and the end of each half is divided by a deep incision into two lobes, the outer almost as large and nearly as long as the inner; in *M. longipes* the median lamella tapers posteriorly much (fig. 6 b) to a little from the end; each half terminates in a short and broad, rounded lobe, and at the outer base of this lobe a somewhat small, triangular and acute tooth is seen. — Finally it may be mentioned that in *M. giganteus* the molar tubercle on the mandibles is low, in *M. longipes* much higher (fig. 6 a); in *M. giganteus* the maxillipeds have second and third joints of the palp considerably broader in proportion to length than in *M. longipes* (comp. my fig. in "Dijmphna-Togtet" with Tattersall's fig. 5), while the difference in the shape of sixth joint mentioned by Tattersall must be merely accidental.

As my specimens of *M. longipes* have lost most of the antennæ and thoracic legs excepting first pair, there may exist unknown differences between *M. giganteus* and *M. longipes* in these appendages.

Length of the best male 18·2 mm. — The other specimen is only 4·3 mm. long, and differs from the large specimen especially in the shape of the end of the median opercular lamella, but supposing that this difference and the somewhat more clumsiness of the preserved second joint of first legs are due to age, I venture to refer it to the present species.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 1 spec. (large ♂).

The "Thor" captured the above-mentioned small male in the warm area.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 1 spec.

Distribution. Some specimens taken in tow-net on trawl or dredge at two places west of Ireland, 350 and 454 fath. (Tattersall).

Eurycope G. O. Sars.

In his Account Sars has given a good description of the genus with eight Norwegian species. From *Eurycope* as limited by Sars a number of species not known at Norway have now been removed to *Storthyngura* Vanh. and *Munnopsurus* Rich. After their removal the remaining forms agree with each other in the following features.

The body is oval and more or less oblong, without processes. Head generally with the front area sharply limited, at least on the sides. The antennulæ are dorsal; first joint large, depressed, rather plate-shaped; second joint somewhat small and short, inserted on the upper surface of first joint before its front margin. Antennæ with a distinct exopod marked off by a suture or articulation. Mandibles with the cutting edge divided into teeth, the movable lacinia on left mandible well developed, some setæ or at least a single seta behind the lacinia, the molar process well developed, moderately to very thick with the end cut off. The articulation between thorax and abdomen and that between sixth and seventh segments well developed. The legs are mentioned in the diagnosis of the group; in this genus fifth joint of the natatory legs is very broad, considerably or much less than twice as long as broad. Median lamella of the male operculum at most very moderately narrowed at the middle.

The material from our area comprises thirteen species, six among them described from Norway, four have been established on species from various other seas and three are new. As some of the forms unknown to Sars are more or less allied to one or another of his species, I found it useful to pay attention to some features not valued or totally omitted in his descriptions, and to correct a few points. Nearly all my specimens have lost most or all thoracic legs, but fortunately their shape or length are not necessary for the determination, as the peduncles of antennulæ and antennæ, the surface of the head, the maxillipeds, the uropods, and the abdominal operculum in both sexes afford a number of excellent characters.

The thirteen species may be divided into two sections in the following way.

Sect. A. Species with all thoracic segments freely movable . . . . Species 89 to 97.

Sect. B. Species with fifth and sixth thoracic segments completely fused, without any dorsal suture between them excepting near the lateral margins . . . . Spec. 98 to 101.

89. Eurycope Murrayi Walker.

(Pl. XII, figs. 7 a—7 b).

1903. *Munnopsis ? Murrayi* Walker, Ann. Mag. Nat. Hist. Ser. 7, Vol. XII, p. 227; Pl. XVIII, figs. 1—6.

1905. *Munnopsis Murrayi* Tattersall, Isopoda, p. 24 and 73; Pl. V, fig. 8.

1911. — — Tattersall, Nord. Plankton. VI. Die nord. Isopoden, p. 190, figs. 8—14.

1913. *Munneurycope Tjalfiensis* Stephensen, Vid. Medd. fra den naturh. Forening i Kjøbenhavn, Vol. 64, p. 99, figs. 6—8.

1915. — — Stephensen, in Rep. Danish Oceanogr. Exped. 1908—10, Vol. II, No. 3, p. 23, figs. 12—13.

The species has suffered from a peculiar fate. It is difficult to understand why Walker referred it, with a query, to *Munnopsis*, as a glance at his figure of the male shows that the animal stands far apart from that genus. Tattersall not only followed Walker, but even dropped the query; it is a new, interesting case that a wrong opinion not infrequently acts as a suggestion, so that a successor accepts it without critical consideration. Stephensen, who believed that the species established by him as *Munneurycope Tjalfiensis* was closely allied to but differing from *M. Murrayi* Walk., saw correctly that it could not remain in *Munnopsis*, and therefore he established a new genus for its reception, but neither in 1913 nor in 1915 was he aware that it would be difficult to point out any character worthy to be considered of generic value between his new genus and *Eurycope*. In his first-named paper Stephensen referred the forms *Munnopsis longicornis* H.J.H. and *M. oceanica* Tatt. to his new genus *Munneurycope*, but in 1915 he removed these two species, so that *Munneurycope* should only comprise *M. Murrayi* Walk. and *M. Tjalfiensis* Steph.

Before entering on the question whether *M. Tjalfiensis* is a synonym to *M. Murrayi* or a separate species, we may examine some features in order to judge of the validity of the genus *Munneurycope*. In 1915 Stephensen published a good number of new figures of his *M. Tjalfiensis*. The first antennular joint is somewhat longer than broad, while in most, but not in all, species of *Eurycope* it is broader than long; furthermore, and what is of more interest, the joint in *M. Tjalfiensis* has no produced antero-lateral part, but in this respect it agrees with the joint in *E. nodifrons* n. sp. Consequently the outline of first antennular joint does not afford any generic character. As to the shape of the body, the antennulæ, antennæ, mandibles, maxillipeds, thoracic segments and legs — as far as these are known — *M. Tjalfiensis* agrees in every point worth mentioning with *Eurycope*. The uropods have the exopod extremely small as compared with the endopod, but in several species of *Eurycope* the exopod is somewhat or considerably shorter than the exopod. The lateral plates of the male operculum show a difference, as the big coupling hook in *M. Tjalfiensis* (fig. 7 b) originates at the truncate, nearly transverse end of the plate, while, f. inst., in *E. inermis* (Pl. XIII, fig. 2 h) the postero-interior angle of the plate is cut off in a way so that the margin where the hook is seen in reality is the somewhat oblique terminal part of the inner margin of the plate. Finally, the penultimate pair of pleopods have the exopod narrow with the end acute in several species of *Eurycope*, while it is broader, obtuse, lamellar in *M. Tjalfiensis*, but unfortunately it is unknown in some species of *Eurycope*. All differences observed have been enumerated here, and I suppose that Carcinologists may agree that *Munneurycope* cannot be maintained. But still one particular may be mentioned. Stephensen pointed out an antennal scale in his species and added: "This last feature has not, as far as I am aware, hitherto been found in any *Munnopsid*"; the antennal squama, however, had been figured and mentioned by me in 1887 ("Dijmphna-Togtet") as found in *Eurycope gigantea*.

Then the question on the validity of *E. Tjalfiensis* as separate from *E. Murrayi*. In 1915 Stephensen enumerated four differences between his own animals and the descriptions and figures of Walker and Tattersall. His animals had "a blackish brown or dark colour", which he thinks is a specific character, because this unusual colour was not mentioned by the two English authors. It is true that Walker said nothing on the colour, but the description had been published more than four and a half years after the capture of the specimens, and I suppose that they had been preserved almost four years before his description was written, and that therefore the colour had faded considerably; Tattersall said in 1911: "Farbe schwarz". — Stephensen wrote: "The exopodite is evenly rounded, not indented; "exopodite" is decidedly an error instead of "epipodite", and when Walker figured the distal part of the inner margin of the epipod of the maxillipeds as deeply and irregularly serrate it is certainly erroneous; such serration is not found in any species of the group *Eurycopini*. — I do not quite understand Stephensen's statement on the palp of the maxillipeds: "the median edge of the 4. joint being somewhat concave" in *M. Tjalfiensis*; judging from his figure he ought to have said "third joint", as this joint has on his figure the inner margin somewhat concave; unfortunately his figure is as to this point either incorrect or shows an individual variation, as I have examined the maxillipeds of some specimens, two among them of his material, and found the inner margin of third joint convex, as shown on my drawing (fig. 7 a), consequently as to this point agreeing with Walker's figure of *E. Murrayi*. That, as Stephensen pointed out, there is a difference in the small terminal joint of the maxillipeds between his species and Walker's figure is true, but it is easily seen that Walker's figures as to such minor points are not accurate, and his text contains nothing on that feature. — Finally Stephensen wrote: "Furthermore, the metasome of *M. Murrayi* is stated as having a blunt carina; no trace of any such is visible in the specimens here concerned." The upper surface of the abdomen is so thin-skinned that it generally is irregularly impressed or somewhat folded, and no keel is visible, but on a well preserved abdomen I observed a feeble, rounded median keel. For the rest, Stephensen and Walker use the term "metasome" for very different sections of the body, as Walker wrote (p. 228): "The first of the last three segments (metasome) with a large oval tubercle on each side of a central cleft." On well preserved specimens I find a longitudinal median cleft not only on the first segment but on the anterior part of the two other segments of the so-called "metasome" — on sixth and seventh thoracic segments the cleft widens posteriorly to be a triangular depressed area — and the surface at each side of the cleft is raised like a badly defined blunt keel or oblong tubercle. It is seen that Walker wrongly applies the name "metasome" used by Sars in his Account, and Stephensen has followed Sars. — I have now analyzed all the differences pointed out by Stephensen as distinctive characters for his *Munneurycope Tjalfiensis*, and it is absolutely certain that it must be cancelled as only a synonym. But it may be added that most of Stephensen's figures in 1915 are fairly accurate, and quite sufficient not only for recognizing the species, but for judging of its peculiarities and affinities.

Occurrence. *E. Murrayi* has not been gathered by the "Ingolf", but at a single locality by the "Tjalfe" and at five places by the "Thor".

West of Cape Farewell: Lat. 60°07′ N., Long. 48°26′ W. 2000 m. wire out, 1 spec. (Stephensen).
South of Iceland: Lat. 61°34′ N., Long. 19°05′ W., Young-fish trawl, 1800 m. wire out; 4 spec.
— - — Lat. 61°30′ N., Long. 17°08′ W., — — 1800 m. — — 14 spec.
— - — Lat. 62°47′ N., Long. 15°03′ W., — — 1500 m. — — 2 spec.
South-West of the Færoes: Lat. 60°00′ N., Long. 10°35′ W., Young-fish trawl, 1000 m. wire out; 3 spec.
— - - — Lat. 59°52′ N., Long. 9°53′ W., — — 1500 m. — — 5½ spec.

Distribution. Taken at several places west of Ireland in townet or young-fish trawl in depths between 350 and 1710 fath. (Walker and Tattersall.). Stephensen recorded it in 1915 from seven places in the East Atlantic between Lat. 50°25′ N. and Lat. 35°53′ N., in every case taken in the young-fish trawl, with the length of the wire out varying from 1500 to 2800 m.

According to all gatherings *E. Murrayi* is pelagic in the deeper layers of the North-Atlantic.

90. **Eurycope nodifrons** n. sp.

(Pl. XIII, figs. 1 a—1 d).

Male. Body (fig. 1 a) a little more than two and a half times as long as broad. — The head (fig. 1 b) has no sharply defined front area, and consequently no rostral projection from the vertex between the first joints of the antennulæ, but the area in question is raised longitudinally, with its posterior half forming a broad, rounded keel marked off by a transverse impression from the anterior half, which is a much broader, considerably vaulted and rounded protuberance.

Of the antennulæ only the left is present. Basal joint rather plate-shaped, slightly broader than long; the lateral margins converge much forwards to the anterior margin which is transverse, and consequently the joint has no antero-interior lobe; second joint, which is inserted considerably behind the front margin of the first, is medium-sized and slightly longer than the third. — Antennæ (fig. 1 a) with the squama well set off, moderately small and somewhat broad at the base, triangular, scarcely one-third as long as the breadth of the third joint. — Mandibles nearly as in *E. cornuta.* Maxillipeds (fig. 1 c) in the main as in *E. Murrayi*, but a little more narrow, and the epipod is about three and a half times as long as broad, with the end obtuse and the outer margin not concave.

First thoracic segment (fig. 1 a) uncommonly long, much longer than the second, while the fourth is very short at the middle; the epimera considerably produced, seen from above triangular and acute. The three posterior segments with their anterior margins extremely convex, and the segments have a longitudinal median impression.

Abdomen longer than in the following forms, nearly as long as broad. — The pleopods of first pair in the male (fig. 1 d) have the proximal two-thirds of their outer margin somewhat concave; at the beginning of the distal third they are as broad as at the base, and then each tapers posteriorly; the terminal part of each pleopod is divided by a rounded incision into two lobes, the inner a little longer than broad, distally broadly rounded and much longer than the outer, which is much narrower and shorter and directed more outwards; the broad end of the inner lobe has several setæ, while the narrow end of the outer is naked. The lateral plates of the operculum rather broad, with the terminal part feebly produced, and the thick coupling hook originating before the rounded end. — (Uropods lost).

Length 5 mm.

Remarks. At first sight *E. nodifrons* is somewhat similar to *E. inermis* n. sp. or *E. cornuta* G. O. S., but on a closer examination it is seen to be intermediate between *E. Murrayi* and *E. inermis* in having no front area marked off by keels and no rostral projection, in the shape of the anterior half of first antennular joint, the shape of the three posterior segments and the abdomen, as the segments have the anterior margin very convex, and the abdomen is somewhat long. One of the most interesting differences between *E. Murrayi* and *E. nodifrons* is, that in the former species the basal joint of the anterior pairs of legs is not produced as an epimeral triangular plate, while in *E. nodifrons* epimeral plates are well developed as in *E. cornuta* and several other species.

Occurrence. Taken by the "Ingolf" at a single deep station in the warm area.
Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., 1·5°; 1 spec.

91. Eurycope cornuta G. O. Sars.
(Pl. XII, figs. 8 a—8 k).

1864. *Eurycope cornuta* G. O. Sars, Forh. Vid. Selsk. Christiania for 1863, p. 209.
1880. — *robusta* Harger, Rep. U. S. Comm. Fish and Fisheries for 1878, Pt. VI, p. 332; Pl. III, fig. 15.
! 1897. — *cornuta* G. O. Sars, Account, II, p. 145; Pl. 64.

The richly illustrated account of this species published by Sars is good as to most particulars, but in order to distinguish *E. cornuta* easily from the two or three next species it is found necessary to redescribe several features.

Sars wrote: "... front produced to an acute, rostriform projection", but this is not correct. The projection or rather the anteriorly protruding part of the front area (fig. 8 a) is not acute; even in co-types of Sars the end of the projection is emarginate and its upper surface somewhat concave longitudinally, as the lateral margins of the front area are raised; furthermore the projection, when seen essentially from the side, has its upper margin horizontal, with the anterior part not curved downwards, and the end of the projection free. — The basal joint of the antennulæ (figs. 8 b, 8 c and 8 d) varies somewhat in shape in individuals even from the same haul; the inner margin is straight, somewhat or considerably shorter than the breadth of the joint, and from a little to a good deal shorter than the distance between the antero-exterior point of the front margin and an obtuse or rounded angle on the hind margin; the anterior margin is irregularly but considerably concave, as the antero-interior part of the joint is produced into a somewhat short lobe; second joint, which originates on the surface of the first considerably behind its front margin, is middle-sized, conspicuously thicker in the male (figs. 8 c and 8 d) than in the female (fig. 8 b); the third joint is much more slender, as long as or somewhat longer than the second. — Antennal squama (fig. 8 e, *sq*) well set off, oblong-triangular, conspicuously less than half as long as the breadth of third antennal joint, and armed at the end and laterally with a few small spines.

Abdominal operculum in the female seen from below (fig. 8 g) much broader than long, in the main transversely oval, with somewhat more than the posterior half of its whole margin almost semicircular; on the lower surface it has a median keel, which is rather far from reaching the anterior or the posterior margin. Seen from the side (fig. 8 f) the female operculum is highly vaulted, with its lower margin angular at the middle, and the posterior angle is rounded. — The median lamella (fig. 8 h) of the male operculum about two and a half times as long as broad, at the middle feebly narrowed, and the distal half of each outer margin flatly convex excepting at the end, as the terminal part of each pleopod is produced backwards as a small plate (fig. 8 i), which is broader than long, with its hind margin somewhat convex and the postero-lateral corner produced into a small, triangular tooth directed outwards. The lateral plates (fig. 8 k) of the male operculum are very broad, though considerably longer than broad, without any broad, hairy lobe on the outer side near the base; the outer margin is slightly concave somewhat before the end, which is feebly produced as a short and moderately broad lobe; the copulatory organ has its second joint long, a good deal longer than the plate, especially because the part containing vesicle and duct is two and a half times as long as the distance from base to vesicle; the thick hook is placed somewhat before the end of the plate, and the distal part of the inner margin of the plate inside the articulation of the hook is a little concave. — The uropods have the basal joint thick and the rami are, as stated by Sars, subequal in length, but the outer ramus is more slender than the inner.

Remarks. The differences between *E. cornuta* and the two next species are mentioned with these forms.

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

North of Iceland: Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0·6°; 1 spec.

Furthermore it is known from three places in Baffin Bay, viz. Lat. 71°10′ N., Long. 58°56′ W., 199 fath. (H. J. Hansen); Umanak Fjord. ab. Lat. 71° N. (H. J. Hansen) and Lille Karajak Fjord, ab. Lat. 70°30′ N. (Vanhöffen). — But when Grieg (1907) recorded it as having been captured by the Duke of Orleans off East Greenland at Lat. 75°58½′ N., Long. 14°08′ W., 300 m., temp. 0·4°, and, besides, in Denmark Strait at Lat. 66°42′ N., Long. 26°40′ W., 550 m., temp. + 0·11°, I consider these statements as possible but not certain, because I do not feel convinced that in the one or in both cases the animals in question have not belonged to *E. inermis* n. sp., formerly mixed up with *E. cornuta* by Sars (see below).

Distribution. It occurs "along the whole coast of Norway, from the Christiania Fjord to Vadsö, in depths ranging from 50 to 400 fathoms" (G. O. Sars). In Skager Rak it has been taken 15 sea-miles from the lighthouse of the Skaw, 125 fath. (Meinert), and at a number of places between Jutland and Norway, in 130 to 340 fath. (H. J. Hansen); the "Thor" has taken it in the North Sea off southern Norway: Lat. 58°32′ N., Long. 4°18′ E., 148 fath. As *E. robusta* Harger is synonymous with *E. cornuta*, this species is known from the Gulf of St. Lawrence, 220 fath. (Harger), but when Harriet Richardson (1905) said: "Atlantic coast of North America" I do not know any observation on which this too loose statement has been based, and the authoress had evidently not seen any specimen in the U. S. National Museum, as she only reprinted the text of Sars.

In 1886 Sars wrote that the Norwegian North-Atlantic Exp. had taken *E. cornuta* at nine stations in the cold area between Norway—Spitzbergen and Iceland—the Færoes in depths from 350 to 1215 fath., and that the animals were in part unusually large. I am sure that all these animals in reality belong to *E. inermis* n. sp. and *E. Hanseni* Ohlin, both larger than *E. cornuta*, similar in aspect and inhabiting the cold area. Stuxberg's statement, copied by Sars and Stephensen, that *E. cornuta* has been taken in the Kara Sea, is also certainly wrong.

92. **Eurycope inermis** n. sp.

(Pl. XIII, figs. 2 a—2 l).

Description. Similar to *E. cornuta*, but larger and a little more slender (fig. 2 a), as a rule a little more than two and a half times as long as broad.

The front area between the basal joints of the antennulæ is rather narrow, longitudinally concave with the lateral margins raised (fig. 2 b) and it tapers strongly forwards, but instead of being horizontal as in *E. cornuta* or *E. Hanseni* its anterior part, seen somewhat from the side, slopes downwards and terminates below without being well marked off from the front just above the vaulted clypeus. — First joint of the antennulæ (fig. 2 c) shaped as in *E. cornuta*, especially as the antero-interior lobe is somewhat short, considerably broader than long; second joint inserted and shaped as in *E. cornuta*, considerably thicker in the male than in the female, a little or somewhat shorter than the more slender third joint. — Antennal squama (fig. 2 d) oblong-triangular, terminating in a spine, and slightly more than half as long as the breadth of third joint. — Maxillipeds (fig. 2 e) have the second joint, counted to the articulation of third joint, half as long again as broad (in this respect it agrees with *E. cornuta*, as Sars has figured the second joint too short); the distal terminal corner of the epipod more rounded than in *E. cornuta*.

Thoracic segments (fig. 2 a) nearly as in *E. cornuta*; the epimera a little more produced than in that species.

The female abdominal operculum very different from that in *E. cornuta*. Seen from below (fig. 2 k) it is broadest much before the middle, and then the most lateral part at each side constitutes a rounded rather short lobe directed outwards; the great portion of the operculum behind these lobes is triangular with each lateral margin a little sinuate and the end narrowly rounded; the surface has a high keel from somewhat from the base to near the posterior end. Seen from the side (fig. 2 i) the operculum is highly vaulted; its lower margin is bent, forming an angle of about 100°, which is placed so far backwards as the insertions of the uropods; the lower margin in front of that angle is long and straight, and behind the angle it is somewhat short and almost vertical on the lower surface of the abdomen. — The male abdominal operculum also differs much from that in *E. cornuta*. Its median lamella (fig. 2 f) is narrower, about three times as long as broad and more constricted near the middle; the terminal part of each pleopod forms a lobe (fig. 2 g), which is conspicuously longer than broad, with setæ along its somewhat convex outer margin and the rather narrowly rounded end; at the outer base of the lobe the pleopod is suddenly a little broader, so that a small and low, rectangular and protruding part is observed. Each lateral plate (fig. 2 h) has a kind of low but very broad, rounded lobe on the basal part at the outer margin, and this lobe has some marginal hairs; the distal half of the outer margin is considerably concave, and the terminal part of the plate is produced into a lobe as long as broad, with both margins concave and the end narrow with a few setæ; the copulatory organ has its second joint rather short, only a little more than half as long as the plate, and the part containing vesicle and duct is only somewhat longer than the part from base to vesicle; the distal part of the inner margin, which runs across the coupling hook, is more concave than in *E. cornuta*. — Uropods (fig. 2 l) with the peduncle thick, the endopod considerably longer and much thicker than the endopod.

Length of large males from the cold area 9—9·3 mm., of females 9—11·5 mm., but the two largest females, both from the "Ingolf" Stat. 103, have no marsupium and are 11·2 and 11·5 mm. long. The length of adult specimens from the warm area 5·5 to 7 mm.

Remarks. *E. inermis* is abundantly distinguished from *E. cornuta* by having the anterior part of the front area curved downwards and without any freely protruding end, by the unequal length of the rami of the uropods, and by the totally different shape of the abdominal operculum both in male and female. But I have been unable to find any difference excepting in size between specimens from the warm and from the cold area. — The differences between *E. inermis* and *E. Hanseni* are pointed out later on.

Occurrence. Taken by the "Ingolf" at five stations in the warm and nine in the cold area.
Davis Strait: Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fath., temp. 3·6°; 9 spec.
— — Stat. 28: Lat. 65°14' N., Long. 55°42' W., 420 fath., temp. 3·5°; 5 spec.
— — Stat. 27: Lat. 64°54' N., Long. 55°10' W., 393 fath., temp. 3·8°; 4 spec.
West of Iceland: Stat. 96: Lat. 65°24' N., Long. 29°00' W., 735 fath., temp. 1·2°; 1 spec.
South-West of Iceland: Stat. 76: Lat. 60°50' N., Long. 26°50' W., 806 fath., temp. 4·1°; 1 spec.
North of the Færoes: Stat. 139: Lat. 63°36' N., Long. 7°30' W., 702 fath., temp. ÷ 0·6°; 2 spec.
East of Iceland: Stat. 103: Lat. 66°23' N., Long. 8°52' W., 579 fath., temp. ÷ 0·6°; 12 spec.
— - — Stat. 102: Lat. 66°23' N., Long. 10°26' W., 750 fath., temp. ÷ 0·9°; 3 spec.
North of Iceland: Stat. 126: Lat. 67°19' N., Long. 15°52' W., 293 fath., temp. ÷ 0·5°; 5 spec.
— - — Stat. 124: Lat. 67°40' N., Long. 15°40' W., 495 fath., temp. ÷ 0·6°; 1½ spec.
North-East of Iceland: Stat. 120: Lat. 67°29' N., Long. 11°32' W., 885 fath., temp. ÷ 1·0°; 8 spec.
— - — Stat. 119: Lat. 67°53' N., Long. 10°19' W., 1010 fath., temp. ÷ 1·0°; 2 spec.
South of Jan Mayen: Stat. 117: Lat. 69°13' N., Long. 8°23' W., 1003 fath., temp. ÷ 1·0°; ab. 18 spec.
— - — — Stat. 116: Lat. 70°05' N., Long. 8°26' W., 371 fath., temp. ÷ 0·4°; 10 spec.
Besides, this species has been taken by the "Thor" at two places in the warm area.
South-West of the Færoes: Lat. 61°17' N., Long. 9°30' W., 443 fath.; 5 spec.
— - - — Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; ab. 15 spec.

Distribution. *E. inermis* has not been separated from *E. cornuta* by Sars, and I am sure that his animals from at least several of the nine stations in the cold area enumerated by him in 1886 as belonging to *E. cornuta* in reality are *E. inermis*; some of his specimens from the deepest stations may belong to *E. Hanseni.* It is probable that the specimens from the Kara Sea referred by Stuxberg to *E. cornuta* belong to *E. inermis*; whether some or all of the above-mentioned specimens referred by Grieg to *E. cornuta* belong to this species or to *E. inermis* cannot be guessed.

E. inermis certainly lives at the bottom, as, in spite of its considerable size, it has not been taken by the "Thor" in the young-fish trawl when this instrument did not touch the bottom. The list shows it to have been found from 293 to 1010 fathoms and to be widely distributed both in the warm and the cold area.

93. **Eurycope Hanseni** Ohlin.

(Pl. XIII, figs. 3 a—3 e).

1901. *Eurycope Hanseni* Ohlin, Bihang till K. Sv. Vet. Akad. Handl. Vol. 26, IV, No. 12, p. 34, figs. 7 a—7 f.

Description. Similar and closely allied to *E. inermis* in size, general appearance, and most features. — The front area (fig. 3 a) between the basal joints of the antennulæ is, seen somewhat from the side, horizontal to the end as in *E. cornuta*, but longer than in this species, consequently very different from that in *E. inermis*; the anterior end is emarginate and protrudes freely and considerably above the base of the clypeus. — The basal joint of the antennulæ (fig. 3 b) differs much in shape from that in *E. cornuta* or *E. inermis*; the inner margin is even slightly longer than the breadth of the joint, as the anterior inner part is produced into a large, triangular lobe which is a little longer than broad and twice as long as in the last-named species; second and third joints mainly as in *E. inermis*. — The antennal squama (fig. 3 c) is longer and more narrow than in *E. inermis*, being somewhat more than half as long as the breadth of third joint.

The thoracic epimera, the uropods (fig. 3 e), the female operculum and the lateral plates of the male operculum do not afford any valuable specific difference from *E. inermis*. Judging from my single male the median lamella of its operculum has the terminal lobes shorter than broad (fig. 3 d), thus considerably shorter than in *E. inermis*.

Length of the largest female, without marsupium (from Stat. 113), 10 mm., of the single male 6·7 mm.

Remarks. *E. Hanseni* is easily distinguished from *E. inermis* by the shape of the anterior part of the front area, from both *E. cornuta* and *E. inermis* by the very long lobe from first antennular joint, from *E. cornuta* besides by the widely different shape of the abdominal operculum in both sexes.

Occurrence. Taken by the "Ingolf" at four stations of the deeper part of the cold area.

East of Iceland: Stat. 105: Lat. 65°34' N., Long. 7°31' W., 762 fath., temp. ÷ 0·8°; 3 spec. (small).
— - — Stat. 102: Lat. 66°23' N., Long. 10°26' W., 750 fath.; temp. ÷ 0·9°; 1 spec.
South of Jan Mayen: Stat. 118: Lat. 68°27' N., Long. 8°20' W., 1060 fath., temp. ÷ 1·0°; 1 spec.
— - — — Stat. 113: Lat. 69°31' N., Long. 7°06' W., 1309 fath., temp. ÷ 1·0°; 4 spec. (large).

Distribution. Ohlin recorded it from a place nearly midway between East Greenland and southern Spitzbergen, viz. at Lat. 77°52' N., Long. 3°5' W., 1460 fath., temp. ÷ 1·4°, and from west of Horn Sound, West Spitzbergen, Lat. 76°36' N., Long. 12°10' E., 929 fath. — Certainly some of the deep-sea specimens of Sars' specimens of *E. cornuta* from the Norw. North-Atlantic Exped. (comp. p. 142) belong to *E. Hanseni*, which evidently is a cold water form inhabiting from considerable to very great depths.

94. **Eurycope complanata** Bonnier.

(Pl. XIII, figs. 4 a—4 e).

1896. *Eurycope complanata* Bonnier, Campagne du "Caudan": Ann. de l'Univ. Lyon, Vol. XXVI, p. 602; Pl. XXXIV, figs. 1 a—1 r.

The species has been elaborately described and on the whole sufficiently figured by Bonnier; some features may yet be mentioned and a few figures added.

The front area (fig. 4 a and 4 b) differs from that in *E. cornuta* in being distinctly broader with the end very deeply incised; the incision is rounded at the bottom and the processes limiting it are about as long as broad, triangular, very acute. — The first joint of the antennulæ at least frequently broader than long, and it differs from that in *E. cornuta* especially in having the inner margin distinctly convex (fig. 4 a) and the inner distal lobe not triangular but obtuse and somewhat broadly rounded, conspicuously broader than long. — The antennal squama (fig. 4 a) oblong-triangular, large or moderately large, conspicuously or even considerably more than half as long as the diameter of third joint. — The maxillipeds have the second joint uncommonly narrow (figured by Bonnier) towards the base, while the outer corner of the epipod is very broadly rounded, and the terminal corner acute, as shown by Bonnier.

The abdominal operculum in the female (fig. 4 e) somewhat reminds one of that in *E. inermis*; its greatest breadth is somewhat before its middle, the most lateral part broadly rounded and setiferous, and from these setæ the lateral margins converge strongly backwards to the median line, but the distal part of each margin is distinctly concave, with the result that the terminal part of the operculum is somewhat produced, and the end is narrowly rounded; the lower surface of the operculum is vaulted and has a median, obtuse keel, which is low at the base and gradually higher backwards to near the end of the plate. — In the male operculum the median lamella (fig. 4 c) is rather similar to that in *E. cornuta*, but the terminal, produced, transverse part of each pleopod is shorter, without any real outer tooth. But the lateral plates are very characteristic (fig. 4 d); each plate is considerably narrower than in *E. cornuta*, with the distal part of the inner margin deeply concave, with the result that the produced distal part of the plate is very narrow, much narrower than in any other species; second joint of the copulatory organ is not much shorter than the plate, and the part from its base to the vesicle is uncommonly long, only a little shorter than the portion containing vesicle and duct, and the distal part is unusually thick and terminates in a tiny spine. — The uropods, which have been well figured by Bonnier, are peculiar, as the peduncle is transverse, being widened obliquely towards the median line of the animal; the endopod projects from the middle of the posterior margin, and the exopod, which is much shorter and thinner, at the outer end of that margin.

Length of the largest specimen, a female without marsupium (from Stat. 24), is 6 mm.; the male (from Stat. 36) is only 3 mm., but Bonnier had a male 5 mm. long.

Remarks. Especially Bonnier's figures of the uropods and of the lateral plates of the male operculum make the determination of my specimens sure.

Occurrence. Taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 4 spec. (and 4 fragments).

— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 spec.

Distribution. Hitherto known only from the Bay of Biscay: Lat. 44°17′ N., Long. 4°38′ W., 504 fath. (Bonnier).

95. **Eurycope brevirostris** n. sp.

(Pl. XIII, figs. 5 a—5 i).

Description. Somewhat more than twice as long as broad, and in general aspect (fig. 5 a) somewhat similar to *E. cornuta*, but very much smaller, and the middle portion of the body, especially fifth thoracic segment, is broader as compared with head or abdomen than in *E. cornuta*, *inermis*, *Hanseni*, or *complanata*. — The epimera considerably produced, with a minute spine on the subacute end.

The front area (figs. 5 b and 5 c) is well developed but somewhat short; its end is flatly rounded or straight, but at each angle a spiniform acute tooth projects forwards. — First joint of the antennulæ (figs. 5 b) in the main as in *E. complanata*, a little broader than long, with the inner margin somewhat convex, the inner distal lobe broad and shorter than broad; second joint inserted somewhat behind the concave front margin of the first, middle-sized, and shorter than third joint. — Antennal squama (fig. 5 d, *ex*) small, only about one-third as long as the diameter of third antennal joint; its end is cut off and bears a spine. — Maxillipeds (fig. 5 e) differ from those in *E. inermis* or *E. cornuta* in having the epipod broader with the distal subtriangular part less produced.

Abdominal operculum of the female (fig. 5 h) somewhat similar to that in *E. cornuta* in the feature that the median keel terminates considerably before both margins, but this highly vaulted operculum has the carinate part of the lower margin, when seen from the side, nearly straight; seen from below the operculum differs considerably from that of *E. cornuta*, as it is only somewhat broader than long, broadest far before the middle, and from the narrowly rounded lateral angles the margins converge backwards as partly moderately convex lines to the rather broadly rounded end. — In the male operculum the median lamella (fig. 5 f) differs mainly from that in *E. cornuta* in having the produced terminal part shorter and broader, without any outer tooth; the lateral plates (fig. 5 g) are about half as long again as broad, thus conspicuously longer than in *E. cornuta*, and somewhat triangular in outline, with the inner basal angle and the outer angle very broadly rounded, while its distal part is shaped nearly as in *E. cornuta*, and the distal part of the inner margin crossing the coupling hook is a little concave; second joint of the copulatory organ is a little shorter than the plate, with the proportion between the distance to the base of the vesicle and the distance between this point and the end nearly as in *E. cornuta*, but the distal fourth of the organ is much thicker than in this species. — Uropods (fig. 5 i) short and thick; the peduncle without any lateral expansion; the endopod at most a little longer than the peduncle, not three times as long as thick, nearly twice as thick as, but only a little longer than, the exopod.

Length of the largest female with marsupium (from Stat. 138) 2·7 mm., of the largest male only 2·1 mm.

Remarks. *E. brevirostris* is easily separated from the preceding forms by a number of features; especially the outline of the small body, the female operculum and the uropods afford good characters.

Occurrence. Taken by the "Ingolf" at two stations in the cold and one station in the warm area.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 2 spec. (poor).
North-West of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0·6°; 18 spec.
East of Iceland: Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 1 spec.

96. **Eurycope producta** G. O. Sars.
(Pl. XIII, fig. 6 a).

1866. *Eurycope producta* G. O. Sars, Nyt Magazin for Naturvid. Vol. 15, I, p. 113. (The whole volume dated 1868).
! 1898. — — G. O. Sars, Account, II, p. 147; Pl. 65.

This species, which is instantly distinguished from all other forms of this section (comp. p. 137) by the extremely conspicuous, long and rather broad, linguiform front area slightly bilobed at the end, has been well described and figured by Sars. Only some remarks may be made.

As to outline *E. producta* differs from *E. brevirostris* in having the head and the abdomen broader in proportion to fifth thoracic segment than in that species, and thus is more similar to *E. cornuta.* Sars said that the front area, the "linguiform projection", is "narrow", but this term is misleading, as the "projection", according to his figures and in co-types presented by him, is long and somewhat broad to the laterally rounded, at the middle emarginate end; furthermore it is longitudinally very concave and, as stated by Sars, the most anterior part of its outer margins is conspicuously denticulate. — The epipod of the maxillipeds varies considerably in shape; sometimes the distal half of its outer margin is, as figured by Sars, scarcely or slightly concave, sometimes distinctly more concave, as the outer angle is a little produced, and in a specimen from the "Ingolf" Stat. 78 the shape shown in fig. 6 a was found, where the margin in question is rather concave, the outer corner being considerably produced.

E. producta is allied to *E. brevirostris* in most features excepting the front area. The antennal squama is scarcely or at most a little larger than in *E. brevirostris.* The female operculum is carinate as in this species, but yet, as figured by Sars, somewhat broader and posteriorly more broadly rounded. The male operculum differs mainly in having the most distal part of each pleopod of first pair produced and triangular (figured by Sars). Uropods with the exopod very much thinner but slightly shorter than the endopod.

Occurrence. Taken by the "Ingolf" at three stations, two in the warm and the third in the cold area.

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 2 spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52 W., 799 fath., temp. 4·5°; 3 spec.

North-West of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷0·6°; 1 spec.

Furthermore it has been taken by Admiral Wandel in Davis Strait: Lat. 65°49′ N., Long. 56°28′ W., 235 fath., temp. 4·4°, 1 spec.; further south it has been taken by Cand. mag. Stephensen at West Greenland in Brede Fjord, ab. Lat. 61° N., 164 fath., 2 spec. The Ryder Exped. secured it off East Greenland: Lat. 69°28′ N., Long. 20°1′ W., 167 fath., 1 spec.

Finally it has been taken twice by the "Thor" at the following places:

South of Iceland: Lat. 62°10′ N., Long. 19°36′ W., 1010—1142 fath.; 2 spec.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 4 spec.

Distribution. Taken at several places along the coast of Norway from Christiania Fjord to Vadsø, in 60 to 400 fath. (G. O. Sars). Later recorded from a locality west of Ireland, 382 fath. (Tattersall).

97. **Eurycope megalura** G. O. Sars.

1872. *Eurycope megalura* G. O. Sars, Forh. Vid. Selsk. Christiania for 1871, p. 274.
! 1898. — — G. O. Sars, Account, II, p. 151; Pl. 69.

A couple of damaged specimens are referred to this species, as they agree with Sars' figures in the size of the posterior thoracic segments, in the shape of the maxillipeds and the uropods, while the abdomen is shaped as in Sars' figure, but seems to be still a little broader and longer in proportion to the three posterior thoracic segments. The front cephalic area seems to differ from the figure of Sars in having no angles at the sides of the terminal emargination, but according to experience in other forms no stress can be laid on this difference.

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

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4.5°; 2 spec.

Distribution. Hitherto known from Stavanger Fjord and Hardanger Fjord, South-West Norway, 150 to 200 fath. (G. O. Sars) and from a locality west of Ireland, 199 fath. (Tattersall).

98. **Eurycope parva** Bonnier.

(Pl. XIII, figs. 7 a—7 e).

1896. *Eurycope parva* Bonnier, Campagne du "Caudan", Ann. l'Univ. Lyon, Vol. XXVI, p. 600; Pl. XXXIII, figs. 4 a—4 e.

The male of this fine species has been figured and described by Bonnier, but the female is unknown. The following description is based on the female, but excepting the operculum it may hold good for both sexes.

Description. Body uncommonly oblong, from slightly less to considerably more than two and a half times as long as broad. — The front cephalic area is extremely large, only a little longer than broad, as its lateral margins converge feebly forwards (comp. fig. 4 a of Bonnier), while the long anterior margin is a little convex, and the surface is feebly arched without keels at the lateral margins. — The first joint of the antennulæ (figs. 7 a and 7 b) is a little longer than broad, with the lateral margins somewhat convex, the outer margin longer than the inner, and the front margin a little oblique; second joint originates somewhat before the front margin of the first, is longer than thick and longer than third joint. — Antennæ with third and fourth peduncular joints (fig. 7 a) somewhat slender and subcylindrical; fourth joint with the outer margin at least as long as the diameter of the joint; squama very small, about one-third as long as the diameter of the joint, rather slender, subconical, with the obtuse end terminating in a small seta. — Maxillipeds (fig. 7 c) moderately slender; fifth joint produced forwards and inwards, so that the distal inner angle is acute, and the inner margin straight excepting towards the base; sixth joint with the lobe short; epipod almost three times as long as broad, with the end obtuse, and the outer margin conspicuously concave somewhat beyond the middle, but without any trace of an outer corner.

The four anterior thoracic segments in the median line together extremely short (figs. 4 a and 4 b in Bonnier) as compared with the sum of the three posterior segments; the epimera at first segment are considerably produced, while those at the three other segments are mainly or totally invisible from above, as they are overlapped by the rather produced corners of the segments. Fifth segment is at the lateral margins as long as the sum of the two posterior segments, and its anterior margin is extremely convex; this segment is dorsally fused with sixth segment, so that a suture between them is seen only near the lateral margins.

Abdomen somewhat small, not much broader than long. The female operculum (figs. 7 d and

7 e) is extremely vaulted and the central part of its median line strongly keeled; seen from the side (fig. 7 d) the operculum is raised so much that it is shaped like a broad triangle, with the angle on the lower margin rounded and situated a little behind the middle; seen from below (fig. 7 e) the operculum is considerably broader than long, with the broadest part rather near the base, the anterior margin with each lateral third considerably concave, the lateral angles broadly rounded, and the margins behind these angles a little convex and strongly converging to the posterior margin, which is transverse, with the median part somewhat convex. — As to the male operculum the reader is referred to Bonnier. — Uropods with the peduncle rather small and short, considerably or much shorter than the endopod, while the slender exopod is scarcely one-third as long as the endopod (fig. 4 d in Bonnier).

Length of an ovigerous female 2·7 mm.; the male according to Bonnier 3 mm.

Remarks. *E. parva* differs strongly in general shape and in several characters from the other forms in this section, in which fifth and sixth thoracic segments are dorsally fused; the female operculum is very peculiar.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 spec.

Besides, it has been taken by the "Thor" at the following place.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 1 spec. (♀ ovig.).

Distribution. Known from the Bay of Biscay: Lat. 44°17′ N., Long. 4°38′ W., 504 fath. (Bonnier).

99. **Eurycope phallangium** G. O. Sars.

(Pl. XIII, fig. 8 a).

1864. *Eurycope Phalangium* G. O. Sars, Forh. Vid. Selsk. Christiania for 1863, p. 210.

! 1898. — *phallangium* G. O. Sars, Account, II, p. 147; Pl. 66.

This species has been well represented by Sars as to most particulars, so that a few notes are sufficient. — Sars' figure of the front area of the head, his "frontal projection", agrees badly with that found in co-types presented by him, while this area in his co-types is similar to those in my "Ingolf" specimens. The area (fig. 8 a) tapers anteriorly less than figured by Sars; its lateral margins are raised like keels, each of which projects as a minute, triangular tooth at the end, while the anterior margin of the area between these teeth is transverse, straight, moderately short and generally showing two or three tiny teeth. — The antennal squama (fig. 8 a) is small, much less than half as long as the diameter of third joint, slender, and tapering feebly to the truncate end, which has a single seta.

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

Davis Strita: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 1 spec.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 6 spec.

Distribution. Common at the south and west coasts of Norway, going northwards to Hasvig in Finmark, occurring in depths from 50 to 300 fath. (G. O. Sars, 1898), in Christiania Fjord taken in 40—60 and even in 30 fath. (Sars 1864). A specimen was taken in Skager Rak, 15 sea-miles from the lighthouse of the Skaw, 125 fath. (H. J. Hansen). Finally gathered on the "Porcupine Bank", west of Ireland, 293 fath. (Tattersall), and recorded with a query from two places respectively east and west at Southern Scotland (T. Scott).

100. **Eurycope furcata** G. O. Sars.
(Pl. XIII, figs. 9 a—9 b).

1870. *Eurycope furcata* G. O. Sars, Forh. Vid. Selsk. Christiania for 1869, p. 165.
! 1898. — — G. O. Sars, Account, II, p. 148; Pl. 67, fig. 2.

To the elaborate representation published by Sars only a couple of remarks may be made. — Fig. 9 b exhibits the outline of the front cephalic area in a co-type presented by Sars; it shows the area broader in proportion to length with the end more broadly incised than in Sars' fig. 2; the specimens presented by him agree with each other in the shape of the area. Fig. 9 a, which represents the head of an "Ingolf" specimen (from Stat. 78), shows a somewhat different shape of the area; it has the lateral margins straight and converging to near the end, which is broadly emarginate with the lateral corners rounded. — The antennal squama (fig. 9 a) is very peculiar in this species; it is moderately slender, long, a little to much more than half as long as the diameter of the third joint, and it reaches considerably beyond the end of fourth joint, and terminates in a couple of setæ on the obtuse or truncate end. — It may be emphasized that, excepting the difference mentioned in the shape of the front cephalic area, my specimens agree well with the figures drawn by Sars.

Occurrence. Taken by the "Ingolf" at two somewhat deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 1 spec.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 2 spec.

Distribution. Sars has recorded *E. furcata* from off Lofoten, 100–120 fath., and from Stavanger Fjord. — I have not found it mentioned by any other author.

101. **Eurycope mutica** G. O. Sars.
(Pl. XIII, figs. 10 a—10 c).

1864. *Eurycope mutica* G. O. Sars, Forh. Vid. Selsk. Christiania for 1863, p. 210.
! 1898. — — G. O. Sars, Account, II, p. 149; Pl. 68, fig. 1.

To the representation of Sars three new figures are added, and a few remarks must be made.

The antennal squama (fig. 10 a, *ex*) is very characteristic; it is shaped as a small tubercle scarcely as long as broad, but distinctly marked off, and it terminates in a very conspicuous, thick, generally straight, stick-shaped seta terminating in a hair. — The abdominal operculum in the male has been incorrectly figured by Sars; the more distal part of both the median lamella and the lateral plates are curved upwards — seen from below (fig. 10 b) downwards — but the lateral plates reach scarcely to the end of the lamella, while in Sars' figure they reach considerably beyond the lamella; furthermore each pleopod of the lamella terminates in two lobes (fig. 10 c), the inner broader and obliquely rounded, the outer somewhat or very narrow. — As to other features *E. mutica*, which is a very characteristic species, has been well figured and described by Sars.

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

West of Iceland: Stat. 87: Lat. 65°02·3′ N., Long. 23°56·2′ W., 110 fath.; 1 spec.

In the Waigat Strait, ab. Lat. 70° N., at West Greenland Mag. Traustedt secured a single specimen; Mag. R. Hørring gathered 5 spec. in Faskruds Fjord, East Iceland, 50—20 fath., and Dr. Th. Mortensen captured 3 spec. off Nolsö, the Færoes, in ab. 100 fath.

Distribution. According to Sars *E. mutica* has been taken in the inner part of the Christiania Fjord and at many places along the coast of Norway, as far north as Bodö (about Lat. $67^1/_2°$ N.). Sars wrote: "It is not strictly a deep-water species, being often found in only a few fathoms' depth among algæ." At Denmark it has been taken in the northern part of the Sound, 14 fath., in the southern Kattegat, 15 fath., and in Skager Rak off the Skaw, 70 fath. (H. J. Hansen). Finally recorded from the North Sea off Northumberland, 59 fath. (Norman) and from the Irish Sea near Isle of Man, 40 fath. (Tattersall). — The species is so small that it has probably been overlooked very frequently.

Group XII. Munnopsini.

Body rather oblong; anterior section of the thoracic segments, and especially third and fourth segments, somewhat or most frequently very much broader than the posterior segments and abdomen. — Head free; eyes wanting. Antennulæ dorsal with first joint plate-shaped; the flagellum with many joints. Antennæ some or several times longer than the body, as the two distal joints of the peduncle are extremely elongate; squama somewhat small, more or less distinct. Mandibles somewhat slender, with the distal parts well developed or much reduced, the molar process either slender conical or wanting; palp well developed or wanting. Maxillipeds normal; epipod rather oblong. — Thoracic segments divided into two sections; the four anterior segments movable, the three posterior either movable or fused with each other and with the abdomen. First pair of legs very slender or moderately strong, more or less prehensile, with second joint long; second pair differ from first pair only in being thicker, much longer and with seventh joint long. Third and fourth pairs differ extremely from second pair in having second and third joints short, and the enormous length of these legs is due to fifth and sixth joints, which are extremely elongate. The three posterior pairs natatory, fifth and sixth joints a little or much expanded with marginal setæ; seventh joint wanting. — Uropods terminal or a little ventral, uniramous, slender.

Remarks. This group differs from the Eurycopini in having uniramous uropods, no seventh joint on the three pairs of natatory legs, and above all in second to fourth pairs of legs, as the second pair are similar to the first and very different from third pair, which have not only the third but above all the second joint short.

Our knowledge of most of the forms of this group has hitherto been very poor, and it may be useful to give a brief review. The only fully known species is *Munnopsis typica* M. Sars. *Munnopsis Murrayi* Walk. (= *Munneurycope Tjalfiensis* Steph.) has been wrongly referred by Walker and Tattersall to *Munnopsis*, but it is, as shown above, a species of *Eurycope*. In 1895 I described *Munnopsis longicornis* H. J. H. on a single mutilated male captured by the German Plankton-Expedition. Stephensen (1913) quoted the following statement from Walker: "As G. O. Sars has pointed out, *Munnopsis longicornis* Hansen differs in the structure of the mandibles from the generic description, as does the present species." (*M. Murrayi*); but this quotation shows that at least neither Walker nor Stephensen had read my text, as I wrote (1895) on *M. longicornis*: "in dem Bau der Schwimmfüsse und Uropoden (so weit sie vorhanden sind) stimmt es mehr mit *Munnopsis typica* M. Sars als mit *Eurycope gigantea* G. O. Sars überein, aber es weicht in dem Bau der Mandibeln gründlich von beiden ab". These words may prove sufficiently that it was very easy for Sars to point out that difference *M. longicornis* H. J. H. is allied to *M. oceanica* Tatt. and *M. spinifer* Vanhöffen (1914). Of the remaining species referred to *Munnopsis*, *M. australis* Bedd. will be mentioned presently; *M. latifrons* Bedd. and *M. longiremis* Richardson are closely allied but, like *M. gracilis* Bedd., too imperfectly known for discussion on affinities.

The material from our area comprises four species, viz. *Munnopsis typica* M. Sars, *M. oceanica* Tatt., a new species closely allied to *M. australis* Bedd., and the form described by Tattersall as *Munnopsoides Beddardi* Tatt. But a study of these forms showed that it was necessary to divide the genus *Munnopsis* into three genera. *M. typica* has the anterior thoracic segments and especially third segment much broader than the rather narrow three posterior segments, and these three are immovably coalesced with each other and with the abdomen; the mandibles have no molar process, well developed palp, and on the left mandible only rudiments of setæ near the lacinia; the natatory legs have the two distal joints moderately broad; in the male the second pair of pleopods are free to the base with their copulatory organ extremely elongate, and the uropods are moderately long; this species must of course remain as the type for the genus *Munnopsis* M. Sars. But *M. oceanica* Tatt. must be removed; it agrees with *M. typica* in having well developed mandibular palps, but the mandibles have a number of well developed setæ before the incisive dentate part and a slender conical molar process; the difference in breadth between the anterior and the posterior thoracic segments is moderate; the three posterior segments and the abdomen are movable, the fifth joint of the natatory legs is much broader than the sixth; the male pleopods of second pair have their proximal part completely fused in the median line, and the copulatory organs moderately elongate; the uropods are long. For the reception of *M. oceanica* Tatt. the generic name *Paramunnopsis* is proposed.

Munnopsis australis Beddard has by Tattersall been taken as type for his genus *Munnopsoides*, to which he also referred his new species *M. Beddardi* Tatt. Supposing that *M. australis* in the main features agrees with my *M. eximius* n. sp. (described later on) these three species show the following features. They agree with *Munnopsis typica* and differ from *Paramunnopsis* n. gen. in having no molar process and the setæ rudimentary on the mandibles, and, besides, in the fact that the three posterior thoracic segments and the abdomen are immovably fused; they differ from both in some features, viz. the mandibles have no palp, the anterior thoracic segments are very broad and the posterior very narrow, the fifth segment even extremely narrow, the natatory legs have the two distal joints very narrow, and the uropods are very short. But in one most interesting feature the two species *M. Beddardi* Tatt. and *M. eximius* n. sp. are very different. In *M. eximius* and therefore, according to the above-named supposition, in *M. australis* Bedd., the male pleopods of second pair are quite independent, and the free part of their copulatory organ more than twice as long as the pleopod (Pl. XIV, fig. 2 n); in the male of *M. Beddardi* Tatt. the same pleopods are fused to such a degree that they constitute a single large plate (Pl. XIV, fig. 3 k) with a posterior oblong incision, in which are found the two copulatory organs, which are small and quite short. This structure, which has been mentioned on p. 10 as being of great morphological significance, I am not prepared to consider as being only of specific value. It seems to me, that this feature makes it necessary to establish a new genus; as Tattersall has taken *Munnopsis australis* Bedd. as the type for his genus *Munnopsoides*, I keep this generic name, and, according to the above-named supposition, refer my new species, *eximius*, to it, but the result is that I must establish a new genus for the reception of *Munnopsoides Beddardi* Tatt., and the name *Pseudomunnopsis* n. gen. is proposed.

Paramunnopsis n. gen.

Description. Body rather oblong; third and fourth thoracic segments somewhat broader than the fifth segment, which is conspicuously broader than the seventh. — First antennular joint is an oblong plate without any protruding distal angle. Antennæ extremely long; the squama (Pl. XIII, fig. 11 b, *ex*) somewhat small but protruding. Mandibles (figs. 11 c—11 e) with the incisive part produced and its edge divided into some triangular teeth, the movable lacinia on left mandible somewhat long with teeth on its terminal margin, the setæ numerous and well developed, the molar process slender and tapering to the acute or subacute end; palp long and robust. Maxillipeds (fig. 11 f) nearly as in *Munnopsis*.

The three posterior thoracic segments and abdomen movable; fifth segment produced much forwards, overlapping a more or less considerable part of the fourth (Pl. XIV, fig. 1 a). — First pair of legs moderately slender, prehensile (second pair in *P. spinifer* Vanh. ♀ considerably longer and thinner than first pair, in the main as in *Munnopsis*). Third and fourth pairs extremely long, nearly as in *Munnopsis*. The three posterior pairs differ from those in *Munnopsis* in having the fifth joint not only much broader than the sixth but differently shaped, as the anterior margin is nearly straight, the major part of the posterior margin extremely convex.

The two anterior pairs of male pleopods in *P. oceanica* (they are unknown in the two other species) show characters probably of generic value. First pair (fig. 11 g) increase much in breadth from somewhat from the base to beyond the middle, and then tapers to the rather narrow end, which has two pairs of small lobes. Second pair (fig. 11 i) have about their proximal third fused, so that no vestige of a suture is seen in the median line; first joint of the copulatory organ long and directed forwards, while the second joint is produced in a long, nearly filiform part reaching considerably beyond the pleopods, and the vesicle is rather far removed from the base of the joint. — Uropods uniramous, two-jointed, long or extremely long.

Remarks. As the type I take *Munnopsis oceanica* Tatt., but *M. longicornis* H.J.H. (1895) and *M. spinifer* Vanh. (1914) belong to the same genus. In the description of the genus features in all three species have been taken into account; excepting the male pleopods most characters can be seen in the text or in the descriptions of the two last-named species. — It may be observed that all three species are really pelagic animals, but only one is represented in our material.

102. **Paramunnopsis oceanica** Tattersall.
(Pl. XIII, figs. 11 a—11 i; Pl. XIV, figs. 1 a—1 b).

! 1905. *Munnopsis oceanica* Tattersall, Isopoda, p. 23 and 72; Pl. V, figs. 1—7.
1911. — — Tattersall, Die nordischen Isopoden, in Nordisches Plankton, VI, p. 187, with figures.
1914. — — Vanhöffen, Deutsche Südpolar-Exp. 1901—1903. Vol. XV, Zool. VII, p. 581, figs. 11 a—b (? and 11 c—d).

Description. Body of a female with marsupium about three times, of the males (fig. 1 a) three and half times as long as broad, without processes or teeth on the dorsal surface or on the lateral margins of thorax and abdomen. — Antennal peduncles nearly twice as long as the body. — Molar process on left mandible (figs. 11 c and 11 e) slender, tapering from the base to the acute end, with five or six oblong acute teeth on the distal half of the posterior margin. — Maxillipeds (fig. 11 f) with fourth and fifth joints conspicuously broader than second joint, which tapers towards the base; sixth joint produced in a lobe, which is much longer than broad and much longer than the joint; distal part of the epipod somewhat produced, but the narrow end obtuse.

Fifth joint of the natatory legs (Tattersall: Isopoda, fig. 6) twice or a little less than twice as long as broad. — Abdomen large, about as long as the sum of the three posterior thoracic segments, oblong-ovate. The median lamella of the male operculum (fig. 11 g) about three times as long as broad; the inner pair of terminal lobes (fig. 11 h) much longer but much narrower than the outer pair. Second pair of pleopods described in the diagnosis of the genus. — Female operculum (Pl. XIV, fig. 1 b) conspicuously broader than long, much shorter than the abdomen, somewhat convex but not carinate, and posteriorly emarginate at the middle. — Uropods in the female as long as, in the male somewhat shorter than, the abdomen (fig. 1 a), and second joint nearly two and a half times as long as the first.

Length of a male 6 mm. (Tattersall recorded 7 mm.), of a female with marsupium 5 mm., of a female without marsupium 6 mm.

Remarks. In this description the differences between *P. oceanica* and the two other less well-known species are indirectly taken into account. The first thoracic leg was figured by Tattersall.

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

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1·5°; 1 spec. (mutilated ♂).

Besides, it has been taken by the "Thor" in young-fish trawl far south of Iceland, at Lat. 61°30' N., Long. 17°08' W., 1800 m. wire out, 3 spec.

Distribution. Tattersall recorded it as taken twice west of Ireland, respectively in townet from 730 to 0 fath. and in young-fish trawl, 1150 fath. Vanhöffen recorded it from the South Atlantic, Lat. 35°10' S., Long. 2°33' E., vertical net from 3000 m. to surface. A badly preserved specimen from the Sub-Antarctic Ocean: Lat. 61°58' S., Long. 95°1' E., vertical net from 2000 m. to surface, referred by Vanhöffen to this species seems to me a little less certain, as he described and figured the molar process of its mandibles as being somewhat different from the usual shape.

Munnopsis M. Sars.

Diagnosis. Body with the anterior section of thoracic segments and especially third segment much broader than the three posterior segments and abdomen. — First antennular joint with the distal inner part considerably protruding beyond the insertion of next joint as a broad triangle with the end obtuse. Antennæ mainly as in *Paramunnopsis;* squama low, moderately distinct. Mandibles reduced; the incisive part terminates in a couple of obtuse teeth, the setæ are few and quite short, the molar process wanting, the palp well developed. — The three posterior thoracic segments immovably fused with each other and with abdomen; fifth segment not overlapping the fourth. Natatory legs with fifth joint about three times as long as broad, not broader than the sixth, and the posterior margin very moderately convex. — The median lamella of the male pleopods moderately broad, feebly broader beyond the middle and then tapering considerably to the end, which terminates in two pairs of small lobes; second pair of pleopods free to the base, and each copulatory organ has first joint rather short and thick, second joint produced in a filament of excessive length. — Uropods moderately long.

Remarks. In this diagnosis some characters not found in earlier descriptions are pointed out mainly in order to separate *Munnopsis* from the other genera of the group. Of the species hitherto referred to *Munnopsis* only *M. typica* seems to remain in it.

103. **Munnopsis typica** M. Sars.

1861. *Munnopsis typica* M. Sars, Forh. Vid. Selsk. Christiania for 1860, p. 84.
! 1868. — — M. Sars, Bidrag til Kundskab om Christianiafjordens Fauna, in Nyt Magaz. for Naturv. Vol. XV, p. 310; Pls. VI—VII.
1887. — — H. J. Hansen, Dijmphna-Togtets zool.-bot. Udbytte, p. 196; Pl. XX, figs. 2—2 e.
! 1897. — — G. O. Sars, Account, II, p. 133; Pls. 57—58.
1905. — — Richardson, Monograph, p. 486; figs. 544—546.

To the fine paper of M. Sars (1868) I added in 1887 (1886) some particulars, chiefly of morphological significance, and these two treatises together with the representation of G. O. Sars and the diagnosis above of the genus give a full account of this interesting form. — As to size it may be said that according to G. O. Sars the length of the adult male is 11 mm.; H. Richardson recorded 13 mm., but Ohlin had from East Greenland a female 15·5 mm. and a male measuring 18 mm., while one of my largest specimens, a female without marsupium from the "Ingolf" Stat. 138, is 17·7 mm. long.

Females from the Kara Sea I found infested with *Sphæronella Munnopsidis* H.J.H. (1897), and on a couple of females taken by the IInd Amdrup-Exped. at East Greenland I found in the marsupium a *Sphæronella*, probably the same species, but not yet investigated.

Occurrence. Taken by the "Ingolf" at eight stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; ab. 20 spec.
— — Stat. 31: Lat. 66°54′ N., Long. 55°34′ W., 88 fath., temp. 1·6°; 1 spec.
— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3·6°; ab. 10 spec.
— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3·5°; 1 spec.
— — Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3·8°; 5 spec.

Between Iceland and the Færoes: Stat. 4: Lat. 67°07′ N., Long. 11°12′ W., 237 fath.; temp. 2·5°; 1 spec.

— — - - — Stat. 2: Lat. 63°04′ N., Long. 9°22′ W., 262 fath.; temp. 5·3°; 2 spec.

North of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0·6°; 12 spec.

It has been recorded from two places at Grinnell Land, the most northern locality being at Lat. 79°44′ N. (Miers), and was taken at several places off West Greenland and in the eastern part of the Baffin Bay between Lat. 78°18′ N. and Lat. 69°31′ N. (several authors); in all six places north of Lat. 77° N. the depths were from 15—20 to 50 fath., but in Baffin Bay they were from 100 to 199 fath. Furthermore it has been secured by the "Thor" south of Iceland: Lat. 63°15′ N., Long. 22°23′ W., 119—172 fath., 1 spec.; and by Admiral Wandel at four places, viz.: North of Iceland in the Skagestrand Bay, 119 fath., temp. 2·9°, 1 spec.; East of Iceland: Lat. 63°15′ N., Long. 9°35′ W., 270 fath., 6 spec.; nearer to Iceland off Seydis Fjord, 135 fath., 2 spec.; finally East of the Færoes: Lat. 61°23′ N., Long. 5°04′ W., 255 fath., temp. 0°, 3 spec. Mag. R. Hörring gathered it in Nord Fjord, East Iceland, 35—55 fath., 1 spec.

At East Greenland *M. typica* has been taken by Danish and foreign expeditions at ten places between Lat. 69°25′ N. and Lat. 77°31′ N.; at two of these places it was secured by the IInd Amdrup-Exped., viz. in Turner Sound, Lat. 69°44′ N., about 3 fath., and in Hurry Inlet, Lat. 70°50′ N., 7—0 fath. in a net for catching eels; the eight other localities have been put together by Stephensen (1913), and their depths were from 5—25 fath. down to 167 fath.

Distribution. Recorded from the Færoe Channel, 540 fath. (Norman), from Skager Rak between Jutland and Norway in depths from 110 to 340 fath. (Meinert, H.J.H.), along the whole coast of Norway from Christiania Fjord to Vadsö, 60 to 400 fath. (G. O. Sars), besides in the sea west of Norway at three stations in the cold area, 350 to 417 fath. and one station in the warm area, 220 fath., temp. 6·0° (G. O. Sars). Furthermore taken between Beeren Eiland and Norway, 217 fath., temp. 2° (Ohlin); north-west of Beeren Eiland, 658 fath., temp. ÷ 1·2° (G. O. Sars); in several places at Spitzbergen, northwards to Lat. 81°14′ N., from 5—8 and down to 175 fath. (Sars, Ohlin); in the Barents Sea, 62 to 180 fath. (Hoek, Weber); at Franz Joseph Land, 2—30 fath. (T. Scott) and somewhat more southwards (Heller), near the south coast of Novaya Zemlya, about 50 fath. (Stappers), in the Kara Sea, 20—100 fath. (Stuxberg, H.J.H.) and eastwards to Long. 78°40′ E. (Stuxberg). — Furthermore it has been gathered in Arctic America, viz. at Lat. 76°48′ N., Long. 88°39′ W. (G. O. Sars), and at two places on the west coast of Baffin Bay, between 5 and 28 fath. (Ohlin); finally in the Gulf of St. Lawrence, in the Bay of Fundy, 60 fath., and off New England (various authors).

This species lives certainly on or near the bottom; in cold places it has frequently been taken in depths from a few and down to about 50 fath., but in warm water it occurs scarcely in lesser depths than 60 to 120 fath., in the warm area it has been taken in depths down to 420 fath., while in the cold area it occurred even in 658 fath.

Munnopsoides Tattersall.

Description. Body with the anterior thoracic segments and especially third segment very much broader than the three posterior segments, which are very slender. — First joint of the antennulæ (Pl. XIV, fig. 2 f) very broad, with the insertion of second joint lateral, and the first joint produced considerably beyond that insertion. Antennæ about as in *Munnopsis*. — Mandibles reduced; without molar process or palp; the incisive part of left mandible (fig. 2 c) showing a terminal feeble emargination as a rudiment of a division into teeth; the lacinia mobilis is somewhat slender with the end subacute, the setæ rudimentary. Maxillæ (fig. 2 d) with the two branches of the outer lobe extremely slender. Maxillipeds (fig. 2 e) about as in *Munnopsis*, but the two distal joints are shorter.

The three posterior thoracic segments immovably fused with each other and with the abdomen; the feeble linear impressions between the segments show by their extreme curvature that almost half of the dorsal part of fifth segment has the sixth tergite as its upper wall, while the lateral parts of fifth segment are seen running far backwards when the animal is inspected from above (fig. 2 a), and a similar structure is found as to seventh segment in proportion to the sixth; fifth segment is narrow at the base and not overlapping any part of the fourth. — First pair of legs (fig. 2 g) very slender and similar in both sexes, with fifth joint conspicuously longer than the sixth. Second pair of legs (fig. 2 h) more than two-thirds as long again as first pair, moderately slender, distinctly thicker and in proportion to the body somewhat longer in the male than in the female. Third and fourth pairs nearly as in *Munnopsis*. Natatory legs very slender; the two distal flattened joints very narrow; fifth joint without setæ on the distal part of the hind margin, and the anterior margin of sixth joint naked excepting towards the end.

Abdomen very slender. — The median lamella of the male operculum navicular (figs. 2 k and 2 m), much compressed, somewhat broad beyond the middle and then considerably tapering to the end, where each half terminates in a triangular lobe; second pair of pleopods quite independent to the base as in *Munnopsis*; the copulatory organ has its basal part very thick (fig. 2 n) and the part beyond the minute vesicle produced into an extremely long thread (*t*, *t*). — Female operculum navicular, much compressed with a median keel, posteriorly scarcely emarginate. — Uropods short, very slender, two-jointed.

Remarks. In 1905 Tattersall established the genus *Munnopsoides*, took *Munnopsis australis* Beddard as its type, and referred his new species *M. Beddardi* to the same genus. Now *M. australis* Bedd. seems to be at least very closely allied to *Munnopsoides eximius* n. sp., so that the generic characters pointed out in this species are in all probability to be found in *M. australis*. But as said already on p. 153, *M. eximius* differs extremely from *M. Beddardi* Tatt. in the structure of second pair of male pleopods, and, besides, considerably in the shape of first pair, so that I create the genus *Pseudomunnopsis* for the reception of *M. Beddardi*. Another difference of probably generic value between *P. Beddardi* and *Munnopsoides* is found in the first pair of legs, which are very slender in *M. australis* and *M. eximius*, but robust in *Pseudom. Beddardi*.

104. **Munnopsoides eximius** n. sp.

(Pl. XIV, figs. 2a—2n).

Description. First joint of the antennulæ (fig. 2 f) even slightly broader than the length from the base to the insertion of second joint; the protuberance beyond that incision considerably broader than long, subtriangular, obtuse. — Antennæ with the very long fifth joint feebly thickened towards the end. — Maxillipeds (fig. 2 e) have the fifth joint somewhat produced at the inner distal corner, and armed with two slender spines near the distal end of the outer (anterior) margin and two spines at the inner margin; the two distal joints are small, the terminal reaching the inner angle of fifth joint.

Seen from the side (fig. 2 b) the dorsal line of the head and of the anterior half of the thorax is in both sexes very convex; in the male the second segment has the dorsal line long with a strong curvature of its own. First segment in both sexes well developed (fig. 2 a), and at the median line as long as third segment; in the female second segment is only a little longer than the first, while in the male it is very much longer and strongly vaulted, wherefore its upper margin is, seen from the side, very convex, and besides its surface has a pair of submedian longitudinal excavations, so that it shows three dorsal, rather broad but moderately low tubercular protuberances. The three posterior segments were described above. — First pair of legs (fig. 2 g) very slender; fifth joint scarcely as thick as the third and longer than the sixth, with some setæ on the lower margin, and two of these are robust. Second pair (fig. 2 h) in the female moderately slender; fifth joint scarcely as thick as the fourth and not much longer than the sixth; the lower margin of fifth and sixth joints armed with numerous, somewhat short spines; in the male these legs are distinctly thicker and somewhat longer than in the other sex. Fourth pair in the female a little less than three and a half times as long as the body.

Abdomen between twice and two and a half times as long as broad, a little longer than the three posterior segments combined (fig. 2 a). To the description of the operculum in both sexes given in the diagnosis of the genus may only be added that the copulatory organ measured from the base of the vesicle to the end is more than three times as long as the pleopod.

Length of a large female without marsupium 8·5 mm. and of its fourth leg 29 mm.; length of the males 5 and 5·7 mm.

Remarks. It is after prolonged hesitation that I establish this species as new instead of referring the animals to *M. australis* Bedd., taken in Lat. 46°16′ S., Long. 48°27′ E., off Marion Island. But Beddard's figures, though evidently far from correct, differ so much from my specimens, that I do not venture to refer them to his species. Beddard has described the first thoracic segment as quite different from anything found in my animals. His figure and description of the antennæ must be wrong, as the shorter joint between the two very long joints of the peduncle cannot exist, and the joint in question can only be the distal part of the very long fifth joint, which has been bent or broken somewhat from its end, but when he figured this part as much thickened such thickening must exist, and it far exceeds what was found in the distal part of that joint in the single antenna seen by me. Furthermore according to Beddard, and especially to a sketch benevolently drawn for me by Dr. Calman, the fifth joint of the maxillipeds has more spines on its outer margin than found by me. Beddard's figure of the second pair of thoracic legs differs widely in several particulars from my fig. 2 h. The result was, that I found it necessary to establish my species as new. — It may still be pointed out that on Beddard's figure of the animal the limits between the three posterior thoracic segments are evidently extremely wrong.

It is easy to separate even very mutilated specimens of *M. eximius* from *Pseudomunnopsis Beddardi* Tatt. by the fact that the latter has a transverse row of stiff setæ on the head at the base of the clypeus, but such setæ are absent in *M. eximius*.

Occurrence. Taken by the "Ingolf" at two stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2·4°; 1 spec.

— — Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1·5°; 6½ spec.

Besides it has been captured by the "Thor" at the two following places.

South of Iceland: Lat. 62°57' N., Long. 19°58' W., 508 fath.; 1 spec.

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 1 spec.

The species is in all probability pelagic, but occurs only at considerably distance from the surface of the sea, as it has never been taken in the numerous vertical hauls from 100 to 0 fath.

Pseudomunnopsis n. gen.

Description. Allied and similar to *Munnopsoides*, but differing in the following characters. — Maxillæ (Pl. XIV, fig. 3 d) with the two rami somewhat less slender. First pair of thoracic legs (fig. 3 g) robust; fifth joint only as long as the sixth, thick and with some slender spines on the lower margin; sixth joint slender. (The three following pairs lost). Natatory legs with no, or at most very few, setæ on the posterior margin of fifth joint, otherwise as in *Munnopsoides*. — The median lamella of the male operculum (fig. 3 h) very narrow, broadest at the base and not far from the end, where each pleopod terminates in a short setiferous lobe (fig. 3 i). Second pair of male pleopods (figs. 3 k and 3 l) fused, forming a large suboval plate with a somewhat deep posterior incision, one-fourth or somewhat more of its total length, and in this very oblong incision, which is narrowed at the distal end, the quite small copulatory organs are found, and these organs reach scarcely to the hind margin of the plate.

Remarks. The genus is established on *Munnopsoides Beddardi* Tatt.

105. Pseudomunnopsis Beddardi Tattersall.

(Pl. XIV, figs. 3 a—3 m).

1905. *Munnopsoides Beddardi* Tattersall, Isopoda, p. 26 and 73; Pl. VI, figs. 1—8.

Description. Outline of the body nearly as in *M. eximius*. — The head has a transverse row of stiff setæ (figs. 3 a—3 b) along the anterior margin at the base of the clypeus. Antennulæ and the four proximal joints of the antennæ nearly as in *M. eximius*. — Maxillipeds (fig. 3 e) a little broader than in the last-named form; fifth joint with about five spines at the outer (anterior) margin between the somewhat produced angle and the insertion of sixth joint (fig. 3 f), while two spines are found near the inner margin.

In the female the four anterior thoracic tergites (fig. 3 b) are much shorter at the middle than towards the sides, with the result that broad and proportionately long membranous areas are seen on the dorsal surface between the well chitinized tergites; the first tergite is at the middle much shorter (narrower) than the second, which is scarcely or slightly longer than the third. In the male (fig. 3 a) the first tergite is still narrower at the middle, while the second tergite is long, longer than the third and the fourth combined, and, besides, much vaulted, with three dorsal longitudinal impressions (an aberrant male is mentioned later on). Seen from the side, the dorsal line of the head with the four anterior segments is almost as convex as in *M. eximius*, and second segment in the male has a curvature of its own. — The three posterior segments slightly to conspicuously less slender than in *M. eximius* but otherwise as in this species.

First pair of thoracic legs (fig. 3 g) have fifth joint about twice as long as deep, with four slender spines on the lower margin; three similar spines are found on the distal part of the lower margin of fourth joint.

Abdomen conspicuously longer than the three posterior thoracic segments combined, less narrow than in *M. eximius*. — The female operculum navicular and keeled nearly as in the last-named form, posteriorly feebly emarginate. The posterior incision in the plate formed by the male uropods of second pair only one-fourth as long as the plate. — Uropods (fig. 3 m) small, slender, with second joint about twice as long as the first.

Length of the largest female (without marsupium) 7 mm., of the male 5.3 mm.

Variation? A single male specimen taken in Davis Strait differs from the typical males in being 6.3 mm. long, in having the posterior section of the body, viz. the three thoracic segments and abdomen, distinctly narrower in proportion to length and distinctly longer in proportion to the whole body; furthermore the second thoracic segment is much shorter, being scarcely longer than the fourth segment, and without the four dorsal tubercles, while the incision in the opercular plate, second pleopods, seems to be a little deeper. I am unable to decide with certainty, whether the specimen belongs to another species or the differences observed are due to variation.

Remarks. The frontal row of setæ and other features prove that in referring the typical specimens to Tattersall's species I am correct. His description and figure of the three posterior thoracic segments are certainly wrong, as no transverse articulations are found between them, but extremely curved impressions; when he said "pleopods normal in structure" it shows that he had not examined them in the male. The only difference difficult to explain between his representation and mine is that he figured the fifth joint of first thoracic legs as considerably more slender in proportion to depth than I found it in the same sex; according to his text that joint should, for the rest, be still longer in proportion to sixth joint than his figure shows it to be.

Occurrence. The male specimen mentioned above under variation? was taken by the "Ingolf" at the following station.

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 1 spec.

The typical specimens have been gathered by the "Thor" at a single place.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 5½ spec. (3 ♀, 2½ ♂).

Distribution. Taken twice west of Ireland in townet attached to trawl or dredge, 199 and 382 fath. (Tattersall). — The species is certainly pelagic in the deeper layers of the sea.

Sub-Order *Flabellifera.*

As already said on p. 4, I have with some reluctance let the family Anthuridæ remain in this sub-order, but remove the family Gnathiidæ, establishing it as a seventh sub-order after the Epicaridea.

Family Cymothoidæ.

This very rich family comprises eight sub-families, but only two, viz. Cirolaninæ and Æginæ, are represented in the material. Before the account of the forms some morphological points may be treated.

In 1903 I pointed out six movable joints in the peduncle of the antennæ in *Bathynomus* and some large species of *Cirolana;* in 1905 I mentioned the same fact as to *Conilera* Leach; in 1912 Racovitza (in Biospeologica, XXVII, Cirolanides: Arch. Zool. Expérim. 5. Sér. Vol. X) found the same number in two genera of his subterranean Cirolaninæ, viz. *Sphæromides* Dollf. and *Typhlocirolana* Racov. Thus several genera of the Cirolaninæ possess the same number of joints in the antennal peduncles as is well known in the Asellota, but while in this sub-order an exopod (squama) is most frequently distinct, it has hitherto been impossible to find an exopod on the peduncles in any species of Cirolaninæ. In the Æginæ not more than five movable joints could be detected in the antennal peduncles.

The structure of the maxillipeds in the male and the ovigerous female of *Cirolana borealis* Lilljeborg I studied in 1890 (Cirolanidæ..., the paper is quoted later on at the species), and it has been investigated again, because Racovitza has attempted a new interpretation of the proximal elements of these appendages in an ovigerous female of an allied form, *Sphæromides Raymondi* Dollf., believing to be able to point out the *præcoxa,* the joint now found by me in a couple of large forms of Asellota (see above, p. 9). In the male of *C. borealis* I found no vestige of a præcoxa, but saw that the figures of the maxillipeds in both sexes published by me in 1890 are correct in every particular. I am not prepared to think that the præcoxa, which does not exist in the male, can be pointed out in the female maxilliped, which has obtained peculiar expansions of the proximal parts, viz. first joint or coxa, epipod, and second joint or basis, in order to create a current of fresh water to the ova or young. The joints existing in the male have been much altered in the ovigerous female, and according to my opinion the epipod, which in the male is a large undivided plate, has in the female been expanded and membranous, with two oblong, smaller plates as remnants of the single large plate in the male. The small plate marked *1* by Racovitza on his fig. V (p. 291) is also seen on fig. 1 l in my paper quoted, to the right of the first joint, the coxa (*1*), and I must consider this plate as being a part of the epipod, not, as Racovitza thinks, a separate joint, the præcoxa. My interpretation in 1890 of the three lamellar expansions in the female maxilliped is certainly correct. And my opinion is corroborated by the structure of the maxillipeds in the male and the ovigerous female of *Mesidothea Sabini* Kr. and *Astacilla granulata* G. O. Sars, both studied later on and figured on Pl. XV.

In 1893 I wrote (in "Zool. Anz." No. 420): "Es folgt aus .... dass man drei Glieder im Stamm von allen gespaltenen Gliedmassen als ein primäres Verhältniss ansehen muss"; on p. 9 in the present paper are briefly summed up most of the cases, where three joints, consequently also a præcoxa, are still extant. Therefore Racovitza's interpretation of the proximal elements in the female maxilliped of *Sphæromides* would have been most welcome, if I had been able to find it correct. — Fortunately I can adopt another proof given by him of my theory on three joints in the sympod of the appendages in Crustacea.

In 1902 Bouvier pointed out the existence of three joints in the peduncles or sympods of the pleopods in the genus *Bathynomus*. In 1903 I confirmed Bouvier's discovery and said: "The gigantic animal is an excellent object for the study of the joints in the sympods of pleopoda, while such joints in animals of normal size are difficult to discover and especially difficult to judge of with certainty". In 1912 Racovitza described and figured (op. cit. p. 294—95, figs. VII and VIII) three joints in the sympod of first pair of pleopods in the moderately large animal *Sphæromides Raymondi* Dollf. (length 24 mm.), but his statement: "Hansen ne trouva cependant qu'un seul article chez toutes les espèces qu'il étudia", is extremely misleading, which is easily seen from the quotation just given, together with the fact that in my earlier main paper on *Cirolana* etc. I said nothing on the morphology of the pleopods. I have never said that I had only found a single joint in the sympod of the pleopods in Cirolaninæ or any other animal of malacostracous Crustacea; at least in many and probably in most Malacostraca exceeding a few millimeters in length two joints can be seen without much difficulty, but according to my theory the sympod shall be composed of three joints, and for various reasons it will generally be either difficult or impossible to point out their elements; besides, I had never made a closer investigation of the sympods of the pleopods in selected types of *Cirolana* or other Isopoda or in various types of Malacostraca. Now I have examined first pair of pleopods in *Cirolana borealis* and a few species of *Æga*, and have been able to find chitinized elements of the three joints in question.

Fig. 6a on Pl. XIV represents the left half of the first abdominal sternite (*st*) with the sympod and the proximal part of endopod (*en*) and exopod (*ex*) of first pleopod, seen from below, of *Æga arctica* Lütk. The third joint (*3.*) of the sympod is firmly chitinized, while first and second joints are thin-skinned with chitinous plates as remnants of the joints. Second joint shows a long transverse plate (*2 o*) reaching the outer margin and divided into two pieces, and a small plate (*2 i*) at the inner margin. First joint has a somewhat large transverse plate (*1 o*) reaching the sternite, while at its inner angle a very firm subquadrangular plate (*1 i*) is seen, which is deeply cleft in the median line and, according to my opinion, consists of the inner part of first joint of both pleopods of first pair, and these two parts are fused at the base. As the pleopods of same pair are moved simultaneously, this fusion of their inner basal part must give strength and uniformity to their movement. — The structure of the sympods of first pair of pleopods in *Cirolana borealis* Lilljeb. (Pl. XIV, fig. 4a) is somewhat similar to that in *Æga arctica*, but the plates of first and especially of second joint are more reduced. The lettering on fig. 4 a is the same as in *Æga*, but it is seen that the outer plate of second joint (*2 o*) is very small and the inner plate found in *Æga* is missing; the outer plate of first joint (*1 o*) is smaller than in *Æga*, while the inner plate (*1 i* is broader, very much shorter and fused, without any posterior incision, with the corresponding plate of the opposite pleopod.

Sub-Family Cirolaninæ.

Two genera are represented in the "Ingolf" area, viz. *Cirolana* Leach and *Eurydice* Leach.

Cirolana Leach.

The material comprises only three well-known species.

106. **Cirolana borealis** Lilljeborg.

(Pl. XIV, fig. 4 a).

1852. *Cirolana borealis* Lilljeborg, Öfvers. K. Sv. Vet. Akad. Förhandl. 18. Årg., 1851, p. 23.
! 1890. — — H. J. Hansen, Vid. Selsk. Skr. 6. Række, naturv.-math. Afd., V. 3, p. 321; Pl. I, figs. 1—1 v.
! 1897. — — G. O. Sars, Account, II, p. 70; Pl. 29.
! 1905. — — H J. Hansen, Journ. Linn. Soc. London, Zool., Vol. XXIX, p. 342.

To the descriptions, figures, remarks on synonymy and habits given in my two papers quoted I have next to nothing to add. The structure of the sympods of first pair of pleopods is described above. Some additional observations on the habits of this interesting animal have been published by Tattersall (Isopoda, 1905).

Occurrence. Not taken by the "Ingolf", but Cand. mag. Ad. Jensen (in "Michael Sars") captured it at a single place.

South-West of the Færoes: Lat. 61°6′ N., Long. 9°21′ W., 210 fath., temp. 7·8°; 9 specimens on bait on long-lines.

In the list on distribution of British Isopoda Tattersall (Isopoda, p. 85) indicated it as known from Iceland, but that must be erroneous.

Distribution. The summary given by me in 1905 may be reprinted with some additions. This species has been taken in various places in the Kattegat, 6 and 13 to 29 fath., and the most northern end of the Sound; along the southern and western coasts of Norway at least to Throndhjem Fjord (G. O. Sars); in Lat. 64°48′ N., Long. 6°32′ E. (G. O. Sars); south-east of the Færoes in Lat. 61°31′ N., Long. 0°39′ W., 104 fath. (by the "Thor"); Shetland Isles (Norman); some places in the North Sea (Zirwas); several places on the coasts of Scotland and Ireland (various authors); west of Ireland in depths from 74 to 220 fath., besides on the shore, and even two specimens dug out of sand (Tattersall), and south-west of Ireland in 808 fath. (Norman); in the Channel at Devon and Guernsey (Norman); various places at or off the west coasts of France (H. J. Hansen; Norman); off Cadiz, 386 fath. (Norman); in the Mediterranean at Naples, 25 fath., at Villafranche (H. J. Hansen), in various places in the western half of that sea down to 648 fath. and in the Adriatic (Dollfus, Norman). Also found off the eastern coast of North America between Lat. 32° and 33° N., Long. $77\frac{1}{3}$° and $78\frac{1}{4}$° W., 233 and 229 fath. (Harger); finally, according to Miss Richardson "off Cape Florida", but this statement is, in my opinion, rather doubtful and needs confirmation.

107. **Cirolana Schmidtii** H. J. Hansen.

1905. *Cirolana Schmidtii* H. J. Hansen, Journ. Linn. Soc. London, Zool. Vol. XXIX, p. 347; Pl. 33, figs. 2 a—2 c.

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

Davis Strait: Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fath., temp. 3.3°; 3 spec.

Besides captured by the "Thor" at a place south-west of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath., 1 spec.

Distribution. Hitherto known only from the two localities mentioned.

108. **Cirolana Hanseni** Bonnier.

1896. *Cirolana Hanseni* Bonnier, Campagne du "Caudan", in Ann. l'Univ. Lyon, Vol. XXVI, p. 574; Pl. XXXII, figs. 1 a—1 o.

1905. — — H. J. Hansen, Journ. Linn. Soc. Lond., Zool. Vol. XXIX, p. 353; Pl. 34, figs. 1 a—1 k.

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

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 1 spec.

Distribution. This small but peculiar form has been recorded from several places, viz. three or four localities between Lat. 59°58' N. and 59°34' N., Long. 7°18' W. and 7°22' W. (Norman, H. J. Hansen), furthermore west of Ireland, 199 and 382 fath. (Tattersall), finally the Bay of Biscay, Lat. 44°36' N., Long. 4°25' W., 345 fath. (Bonnier).

Eurydice Leach.

Of the seven species hitherto known from the European seas only one has been found in our area[1]. But a new and very interesting deep-sea form can be added.

109. **Eurydice Grimaldii** Dollfus.

1888. *Eurydice Grimaldii* Dollfus, Bull. Soc. Zool. France, Vol. XIII, p. 6.

! 1890. — *elegantula* H. J. Hansen, Vid. Selsk. Skr. 6. Række, naturv.-math. Afd. V, 3, p. 364; Pl. V, figs. 2—2 t.

! 1905. — *Grimaldii* H. J. Hansen, Jour. Linn. Soc. Lond., Zool. Vol. XXIX, p. 361.

[1] It seems to be possible that *E. inermis* H. J. H. may in the future be found pelagic in the southern part of the "Ingolf" area, as it has been taken as far north as off Dennis Head, in Lat. 59°25' N., Long. 2°24' W.

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

South-West of Iceland: Stat. 85: Lat. 63°21' N., Long. 25°21' W., 170 fath.; 5 spec.

— - — Stat. 73: Lat. 62°58' N., Long. 23°28' W., 486 fath., temp. 5·5°; 1 specimen in the trawl, but numerous specimens in the Apstein net, consequently near the surface.

Off Iceland it has been taken five times by the "Thor" in the following localities.

West of Iceland: Lat. 65°50' N., Long. 26°53' W., young-fish trawl; 1 spec.

— - — Lat. 65°00' N., Long. 28°10' W., — — — 1 spec.

South - — Lat. 63°11' N., Long. 21°30' W., — — — 400 m. wire out; 1 spec.

— - — Lat. 63°08' N., Long. 21°30' W., — — — 2 spec.

— - — Lat. 63°05' N., Long. 20°07' W.; 1 spec.

Around the Færoes it has been gathered several times (various collectors).

Distribution. Taken in Lat. 59° N., Long. 17°50' W. (by Mag. W. Lundbeck), furthermore in the area between this locality, the Færoes and the northern Scotland, and, besides, west of Scotland (Copenhagen Museum). It is not uncommon west, south-west and south of Ireland (Walker, Tattersall, Stephensen), and has been recorded from off Cadiz (H. J. Hansen), south-west of Portugal (Stephensen), and at the Azores (Dollfus).

This species has been taken many times either near the surface or in young-fish trawl, and is probably always pelagic in the upper strata of the sea. For this reason some records on the depths of the stations have been omitted.

110. **Eurydice caeca** n. sp.

(Pl. XIV, figs. 5 a—5 k).

Male. Body somewhat less than three times as long as broad, and in general outline (fig. 5 a) somewhat resembling that of *E. truncata*, but the last abdominal segment is proportionately larger.

The frontal plate (fig. 5 b, *f*) is very conspicuous, uncommonly large, almost as broad as long, subquadrangular, with the greatest breadth distinctly in front of the middle; the anterior end is angular, and the anterior part of the plate covers the inner proximal part of first joint of the antennulæ. — Eyes completely wanting. — Antennulæ short, reaching about to the end of the penultimate joint of the antennal peduncles. First joint somewhat thick, oblong, directed forwards; second joint moderately thick and directed outwards; third joint long and very slender; flagellum shorter than third joint of the peduncle, 4-jointed, but the first and the fourth joint extremely short. — Antennæ proportionately short, reaching about the hind margin of third thoracic segment. Last joint of the peduncle only a little longer but conspicuously more slender than the penultimate joint (fig. 5 b). Flagellum with 9 or 10 joints.

Mandibles (fig. 5 c) normal; the pars molaris (fig. 5 d) differs from that in *E. Grimaldii* (comp. my paper in 1890) in having a much smaller number of marginal teeth; these teeth are triangular and much broader than in the last-named form, the proximal teeth being considerably broader than long, while the most distal teeth are a little longer than broad. — Maxillipeds (fig. 5 e) have the joints of the palp distinctly more narrow than in *E. Grimaldii* or *E. pulchra;* the lobe from second joint (l^2)

is somewhat long, rather narrow, as in the other forms of the genus without coupling hooks, and terminates in two extremely long, stiff, plumose setæ.

Epimera in the main similar to those in *E. inermis*; the outer (lower) margin of the three posterior pairs is unusually convex, and their posterior angle is produced into a quite minute, acute tooth. — Thoracic legs (figs. 5 f, 5 g, 5 h) with very few setæ and a smaller number of spines than in any other European species. Seventh pair (fig. 5 h) slender excepting second joint; fourth joint only a little less than twice as long as broad and about as long as the fifth, while sixth joint is about half as long again as the fifth.

Last abdominal segment (fig. 5 i) without any distinct dorsal impression; the lateral margins are curved a little upwards with the result that the surface along them is a little excavated. Posterior margin long and on the whole moderately convex, with a very obtuse and feeble angle at the middle, while each half of this margin has some irregular, somewhat to very small teeth and a few quite short setæ, but no articulated spines.

The appendix masculina (fig. 5 k) attached nearer the base of the endopod than in any other form of this genus; the appendix reaches somewhat beyond the ramus, and its distal part is peculiarly shaped, as may be seen in the figure.

Uropods (fig. 5 i) small; both rami considerably narrower than in any other European species and shaped nearly as in some forms of *Cirolana*, slightly more than three times as long as broad and tapering from the middle to the narrow end, which has a small incision; the endopod is considerably longer than the exopod, with the distal half of its outer margin coarsely serrate and that of the inner margin very finely serrate; the margins of the exopod with a couple of saw-teeth.

Colour of the specimen while in formaline a few months after capture deeply high-red.

Length 7·1 mm.

Remarks. *E. caeca* is a most interesting species, differing from other forms of the genus in having no eyes, in the size and shape of the frontal plate, in the antennulæ, the proximal insertion of the appendix masculina, the shape of the uropods, and finally in colour. But as it agrees with other North-Atlantic forms in the peduncles of the antennæ, the mouth-parts, the essential features of the thoracic legs, etc., it was deemed incorrect to establish a new genus for its reception.

Occurrence. Taken only by the "Thor", July 11, 1904, at the following place.

South of Iceland: Lat. 61°30′ N., Long. 17°08′ W., young-fish trawl, 1800 m. wire out; 1 spec.

Judging from the absence of eyes, the colour and the length of wire out *E. caeca* belongs to the pelagic deep-sea fauna.

Sub-Family Ægidæ.

The main paper on the forms is still that published by Schiødte & Meinert in Naturh. Tidsskr. 3. Række, Vol. XII, 1879. The authors, who had studied a vast material from nearly all large museums in the world, pronounced that females with marsupial lamellæ had never been taken on fishes, but had, if known, always been taken by the dredge. Of the North-Atlantic and arctic forms of the genus

Æga they had seen a very large number of specimens, but excepting *Æ. ventrosa*, not one female with marsupium, and consequently they maintained that females with marsupium of these forms must be found on the bottom of the sea. The "Ingolf" has proved the correctness of this view, as it has taken with trawl or dredge two females with marsupium of *Æga psora* L. in depths of about 300 fath., and five similar specimens of *Æga arctica* Lütk. at three stations with depths from 568 to 799 fath. These facts are pointed out here because they are of special interest.

As to morphology a few points may be briefly mentioned. As already said, the antennæ have only five joints in the peduncle; it was even impossible to find any vestige of a præcoxa. — In the above-named paper on Cirolanidæ etc. (1890) a detailed description with figures of the mouth-parts in both sexes of two genera of the Æginæ is found; I showed the extreme expansions of the proximal parts of the maxillipeds in ovigerous females of *Rocinela*, and stated that in *Æga* a similar structure was found. I refer to these facts, as authors — f. inst. G. O. Sars in his standard work — generally examined the mouth-parts of females without marsupium or of males, overlooking the extreme differences between the maxillipeds in such specimens and in females with marsupium.

The material comprises representatives for three genera.

Æga Leach.

Of this rich genus eight species have been collected within our area. No new species was found, and seven of the forms have been described and figured not only by Schiødte & Meinert (op. cit.) but by G. O. Sars, so that they are very well known.

111. Æga psora L.

1761. *Oniscus Psora* Linné, Fauna Suec. Ed. II. p. 499.
! 1879. *Æga Psora* Schiødte & Meinert, op. cit. p. 357; Pl. VIII, figs. 5–6.
! 1897. — *psora* G. O. Sars, Account, II, p. 59; Pl. 24.
1905. — — Richardson, Monograph, p. 168, fig. 148.

Two females with marsupium have been taken by the "Ingolf", and the largest specimen is 36·2 mm. long and 18·5 mm. broad. Schiødte & Meinert stated their largest female without marsupium to be 48 mm., and the largest specimen measured by me is 49·5 mm., but in this and other species of *Æga* the animals taken on fishes are frequently much distended, due to an enormous quantity of food, and consequently the thoracic segments are removed from each other.

Schiødte & Meinert recorded *Æ. psora* as taken on *Gadus morrhua* and *Somniosus microcephalus.* Our Museum possesses specimens taken on the same fishes and, besides, on *Gadus ogac, Hippoglossus pinguis, Hippoglossus vulgaris* and *Anarrhichas latifrons.* Sars has, besides, recorded it from *Gadus æglefinus* and *Molva vulgaris*, Richardson from *Cottus scorpius* and *Raja batis.*

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

West of Iceland: Stat. 89: Lat. 64°45′ N., Long. 27°20′ W., 310 fath., temp. 8·4°; 1 spec. (ovig. ♀).
— - — Stat. 9: Lat. 64°18′ N., Long. 27°00′ W., 295 fath., temp. 5·8°; 11 spec. (1 ♀ with marsup.).

Besides it has been gathered numerous times and by many collectors within the "Ingolf" area. Along the west coast of Greenland or more distant from the coast it has been captured from Umanak, ab. Lat. 70°40′ N., southwards to Nanortalik, in Lat. 60°07′ N., at fourteen localities, all — excepting Jakobshavn — enumerated in Stephensen's Conspectus. At East Greenland it has only been found at Angmagsalik, Lat. 65°30′ N., by Mr. Søren Nielsen. — It is common at Iceland, having been secured in Dyre Fjord, Onundar Fjord and Höfn Bugt on the north-western coast, in Ofjord and Skjalfandi on the north coast, in Seydis Fjord on the east coast; around the Færoes it has been taken numerous times. The deepest station was in Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath., and it has also been taken in 340, 250, 190 and 60 fath.

Distribution. Several specimens have been taken at the north coast and the most northern part of the east coast of Jutland. It "occurs rather frequently along the whole coast of Norway, from the Christiania Fjord to Vadsø" (G. O. Sars). Besides it is known from "Lapponia Russica" (Schiødte & Mein.); Barents Sea in Lat. 72°36′ N., Long. 24°57′ E., 140 fath., temp. 1·7° (Max Weber); Spitzbergen (Miers, Ohlin); Scotland, north-eastern England and Ireland (various authors). Richardson recorded it from Hudson Bay, Labrador, New Foundland, Nova Scotia, a number of places along the more northern part of the east coast of the Unit. States, finally from the Gulf of Mexico between the Missisippi and Florida, but this last-named locality seems to need confirmation.

112. **Æga tridens** Leach.

1815. *Æga tridens* Leach, Trans. Linn. Soc. Lond. Vol. XI, p. 370.
! 1879. — — Schiødte & Meinert, op. cit. p. 340; Pl. VII, figs. 1—2.
! 1897. — — G. O. Sars, Account, II, p. 60; Pl. 25, fig. 1.

Occurrence. Not taken by the "Ingolf" or any other of the Danish expeditions. But a specimen taken on *Gadus morrhua* has been recorded from Thorshavn, the Færoes (Sch. & Mein.), and later another specimen has been procured at the same islands by the Physician Jørgensen (Copenhagen Museum).

Distribution. *Æ. tridens* seems to be rare. G. O. Sars recorded it from Bergen and Christianssund on the south-west coast of Norway and from the Christiania Fjord. Besides it has been taken north of the Shetland Islands in Lat. 61°15′ N., Long. 1°30′ W., 110 fath. (Zirwas), at both sides of Scotland and at Belfast (various authors).

113. **Æga Stroemii** Lütken.

1859. *Æga Stroemii* Lütken, Vid. Medd. Naturh. Foren. Kjøbenhavn for 1858, p. 68, Pl. I. A, figs. 6—8.
! 1879. — — Schiødte & Meinert, op. cit. p. 349, Pl. VII, figs. 10—15.
! 1897. — — G. O. Sars, Account, II, p. 60; Pl. 25, fig. 2.

This species has been taken most frequently on *Gadus morrhua*, but also on *Gadus æglefinus* and *Acanthias vulgaris* (G. O. Sars); Dr. J. Schmidt and Cand. mag. Ad. Jensen have found it on *Centrophorus squamosus*. — The largest specimen seen by me is 42·5 mm., but Schiødte & Meinert recorded 49 mm. as the greatest length.

Occurrence. Not taken by the "Ingolf". — The Copenhagen Museum possesses nine specimens from the "Ingolf" area. It has been collected at Iceland (A. Feddersen); south of Iceland in Lat. 63°15′ N., Long. 22°23′ W., 114—142 fath., and at some distance from the last-named locality on *Centrophorus squamosus* („Thor"). It has been recorded from the Færoes (Schiødte & Mein.) and later taken at Thorshavn, the Færoes; finally secured by Cand. mag. Ad. Jensen on *Centr. squamosus* from Lat. 61°6′ N., Long. 9°21′ W., 210 fath.

Distribution. Northern end of Jutland and Skager Rak (Sch. & Mein.); south and west coast of Norway, northwards at least to the Lofoten Islands (G. O. Sars). Besides, taken in the North Sea at Lat. 57°20′ N., Long. 2°9′ E. (Zirwas). east of Durham (Norman), west of the Shetland Isles, 203 fath. (Norman), and by the "Thor" south-west of Ireland: Lat. 51°29′ N., Long. 11°45′ W., 478 fath.

114. **Æga crenulata** Lütken.

1859. *Æga crenulata* Lütken, Vid. Medd. Naturh. Foren. Kjøbenhavn for 1858, p. 70; Pl. I. A, figs. 4—5.
! 1879. — — Schiødte & Meinert, op. cit. p. 343; Pl. VII, figs. 6—9.
! 1897. — — G. O. Sars, Account, II, p. 61; Pl. 25, fig. 3.

The greatest length recorded for a female without marsupium is 65 mm. (Sch. & Mein.); a fine specimen taken by the "Thor" is 57 mm. — According to the literature taken only on *Somniosus microcephalus*; in 1902 Cand. mag. Ad. Jensen found it at the Færoes on *Molva byrkelange*.

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

South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 1 spec.

At West Greenland it has been taken at some places, thus Umanak in Lat. 70°40′ N., Ritenbenk in Lat. 69°44′ N. (Sch. & Mein.), and Julianehaab in Lat. 60°43′ N. (captured by Rev. Sørensen). — At Iceland it has been gathered several times, but of special localities only Øfjord on the north coast has been indicated (Sch. & Mein.); later it was taken in Dyre Fjord, north-west coast of Iceland, by A. Feddersen. The "Thor" captured the above-named fine specimen south of Iceland in Lat. 62°57′ N., Long. 19°58′ W., 508 fath. — From the Færoes it was recorded by Schiødte & Meinert, and taken by Cand. mag. Ad. Jensen in Lat. 62°30′ N., Long. 5°16′ W., 250 fath., on *Molva byrkelange*.

Distribution. A specimen has been taken in Skager Rak at the north coast of Jutland (Meinert). At Norway it has been taken in the Christiania Fjord and at some places on the south and west coasts of Norway, northwards to Komag Fjord, West Finmark (Sch. & Mein.; G. O. Sars). A specimen has been procured off Shetland, Lat. 61°30′ N., Long. 0°10′ E., 101 fath. (Zirwas); another off Aberdeen (Matthews), and a third off the west coast of Ireland, 242 fath. (Tattersall).

115. **Æga monophthalma** Johnston.

1834. *Æga monophthalma* Johnston, Loudon's Mag. Nat. Hist. Vol. VII, p. 232, fig. 43, a, b. (test. Norman).
1879. — — Schiødte & Meinert, op. cit. p. 365.
! 1897. — — G. O. Sars, Account, II, p. 62; Pl. 26, fig. 1.

The greatest size recorded of the female without marsupium is 56·5 mm. According to the literature it lives on *Gadus morrhua* and *Somniosus microcephalus*; Dr. Joh. Schmidt took a fine male, 45 mm. long, on *Centrophorus squamosus*.

Occurrence. Not taken by the "Ingolf". But it was recorded from Iceland (Sch. & Mein.), and the above-named specimen from *Centrophorus* was secured south-west of the Færoes in Lat. 61°08′ N., Long. 9°28′ W., 377 fath.

Distribution. A couple of specimens secured at the north coast, and a third specimen at the west coast of Jutland (Meinert, H. J. Hansen). At Norway taken in the Christiania Fjord and at a few places on the south and west coasts, northwards to Trondhjem Fjord (G. O. Sars). At Great Britain found at Shetland, in Moray Firth, finally at Northumberland and Durham (Bate & Westwood; Norman).

116. **Æga arctica** Lütken.
(Pl. XIV, fig. 6 a).

1859. *Æga arctica* Lütken, Vid. Medd. Nat. Foren. Kjøbenhavn for 1858, p. 71; Pl. I. A., figs. 1–3.
1879. — — Schiødte & Meinert, op. cit. p. 374.
! 1897. — — G. O. Sars, Account, II, p. 63; Pl. 26, fig. 2.

The greatest female without marsupium recorded in the literature was 43 mm. long, the greatest male 36 mm. But at Egedesminde, West Greenland, the Rev. Sørensen has secured a distended female without marsupium measuring 47 mm. Females with marsupium were hitherto unknown, but as already stated, the "Ingolf" has captured five such females at three stations; one among them is only 32·3 mm. long, but the two largest specimens are 40 mm. long. — It has been taken several times on *Somniosus microcephalus*.

Fig. 6 a, representing the proximal half of first left pleopod, has been described above on p. 163.

Occurrence. *Æ. arctica* has been taken in trawl or dredge by the "Ingolf" at five stations.

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 3 spec. (1 ovigerous ♀).
West of Iceland: Stat. 90: Lat. 64°45′ N., Long. 29°06′ W., 568 fath., temp. 4·4°; 7 spec. (2 ♀ with marsupium).
— — Stat. 89: Lat. 64°45′ N., Long. 27°20′ W., 310 fath., temp. 8·4°; 7 spec.
South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 5 spec.
— — Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 11 spec. (2 ♀ with marsupium).

According to Schiødte & Meinert it has been taken frequently at West Greenland, but only two special localities were recorded, viz., Umanak, in Lat. 70°40′ N., and Hundeoerne near Egedesminde, Lat. 68°42′ N. Later it has been recorded from Lille Karajok Fjord, Lat. 70°20′ N. (Vanhöffen), and the

Rev. Sørensen captured it at Egedesminde, and at Julianehaab, Lat. 60°43′ N. Mr. Søren Nielsen secured two specimens at Angmagsalik, Lat. 65°30′ N., in East Greenland. — It was recorded from the north-western and the southern coast of Iceland (Sch. & Mein.). The "Thor" has taken it west of Iceland in Lat. 64°13′ N., Long. 27°30′ W., long-lines, 440 fath., and south-west of the Færoes, Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.

Distribution. At Norway a single specimen has been procured in Finmark (G. O. Sars). A specimen was dredged off the west coast of Ireland, 388 fath. (Tattersall).

The localities enumerated show that *Æ. arctica* is not uncommon at West Greenland and off West and South-West Iceland, that it has been taken in trawl or dredge eight times in depths from 310 to 799 fath., but that all these places belong to the warm area.

117. **Æga ventrosa** M. Sars.

1859. *Æga ventrosa* M. Sars, Forh. Vid. Selsk. Christiania for 1858, p. 156.
! 1879. — — Schiødte & Meinert, op. cit., p. 375; Pl. IX, figs. 7—10.
! 1897. — — G. O. Sars, Account, II, p. 64; Pl. 26, fig. 3.
1913. — — K. Stephensen, Conspectus, p. 234 (containing full synonymy).

As to the structure a few remarks may be made. — The frontal plate is compressed and constitutes a somewhat high, transverse keel; in most specimens its lower sharp margin is straight, but in the ovigerous female from the "Ingolf" Stat. 81 and in a female from Hardanger Fjord (Norway) the lower margin is considerably concave. — The last abdominal segment has the end a little or slightly produced, acute or subacute, and the terminal part of the rami of the uropods is triangular with the end acute or subacute. But in a not adult specimen from the "Ingolf" Stat. 95 the end of abdomen is completely rounded, and the end of each ramus of the uropods is also rounded, but the right outer ramus is considerably more broadly rounded than the left, and as the animal in other features agrees with normal specimens taken at the same station, I must consider the specimen as a variety.

The complicated and curious synonymy pointed out by me (in 1887) and corroborated by Sars (1897) has been put together by Stephensen, l. c. — The length recorded of the female without marsupium is 27 mm., of the ovigerous female 22 mm., but the "Ingolf" captured a female with marsupium measuring 33 mm. in length, and a female without marsupium 32 mm. long.

It may be noted that the specimen from the "Ingolf" Stat. 85 is only 14·5 mm., shows the features of moulting, and therefore agrees with *Ægiochus Nordenskiöldii* Bovallius.

It is interesting that the great majority of the specimens of this species hitherto collected have been taken in dredge or trawl. Sars had taken all his specimens at various places in the dredge, but supposes, that "it at times infests fishes of one kind or another"; Schiødte & Meinert, Norman and Tattersall have no records of its occurrence on fishes. But in 1902 Cand. mag. Ad. Jensen (in "Michael Sars") found near the Færoes a specimen on *Gadus morrhua*, a second specimen on *Brosmius brosme*, a third on *Molva byrkelange*, and several specimens on *Hippoglossus vulgaris*.

Occurrence. *Æ. ventrosa* has been captured by the "Ingolf" at several stations.

West of Iceland: Stat. 98: Lat. 65°38′ N., Long. 26°27′ W., 138 fath., temp. 5·9°; 2 spec. (1 ♀ with young).
— - — Stat. 95: Lat. 65°14′ N., Long. 30°39′ W., 752 fath., temp. 2·1°; 4 spec.
— - — Stat. 9: Lat. 64°18′ N., Long. 27°00′ W., 295 fath., temp. 5·8°; 4 spec.
— - — Stat. 85: Lat. 63°21′ N., Long. 25°21′ W., 170 fath., temp. ? ; 1 spec.
South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 2 spec. (1 ovig. ♀).
— - — Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 6 spec. (1 ♀ with marsupium).

Furthermore it was taken in Davis Strait, Lat. 66°42′ N., Long. 56°12′ W., 130 fath. (Stephensen), and off Cape Farewell, Lat. 59°33′ N., Long. 43°25′ W., 120 fath. (Bovallius). Cand. mag. Ad. Jensen captured it at five places near to or a little east of the Færoes, about half of the specimens on the fishes enumerated above.

Distribution. A specimen was taken at Bohuslän, west coast of Sweden (Bovallius). "The species would seem to occur not infrequently along the whole Norwegian coast, from the Christiania Fjord to Komag Fjord in West Finmark", in "rather considerable depths descending to 300 fathoms" (G. O. Sars). Sars has also (1886) recorded it from Lat. 71°25′ N., Long. 15°41′ E., 620 fath., temp. ÷ 1·0°, a station situated not very far from the limit between cold and warm temperatures at the bottom; Max Weber recorded it from another station between Norway and Spitzbergen, viz. Lat. 71°55′ N., Long. 18°30′ E., 177 fath., temp. 2·4°, but Stephensen's statements on its occurrence at Spitzbergen and in the Kara Sea must be due to some mistake. Finally it has been gathered three times west of Shetland, 203 to 312 fath. (Norman), and twice west of Ireland, 337 and 350 fath. (Tattersall).

118. **Æga gracilipes** H. J. Hansen.

! 1895. *Æga gracilipes* H. J. Hansen, Ergebn. der Plankton-Exped. Vol. II, G. c., p. 15; Pl. I, figs. 6–6 c.
1905. — — Richardson, Monograph, p. 183.

The single specimen, a female without marsupium with the thorax distended, is 29 mm. long and 13·4 mm. broad, thus conspicuously more than twice as long as broad, considerably larger and much less telescoped than the specimen figured by me in 1895; the thorax is therefore proportionately longer, half as long again as the abdomen, and the outline of the animal is similar to that of a normal specimen of *Æ. ventrosa*. In all important features, viz., the large size of the eyes, the shape of lamina frontalis and of the last abdominal segment and the uropods, the slender legs with very few spines, especially the slenderness and length of the distal half of the three anterior pairs, etc., the specimen agrees completely with my description and figures.

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

South-West of Iceland: Stat. 83: Lat. 62°25′ N., Long. 28°30′ W., 912 fath., temp. 3·5°; 1 spec.

Distribution. Only two specimens have been recorded in the literature. The type was procured north-west of Scotland: Lat. 59°0′ N., Long. 8·5° W., 801 fath. (H. J. Hansen); the second specimen is from the Gulf of Mexico, 730 fath. (Richardson). — The species has thus been taken in depths from 730 to 912 fath., and seems to be a real deep-sea form.

Rocinela Leach.

Of this genus only a single species is known with certainty from our area, but a second species of somewhat doubtful origin must also be mentioned.

119. Rocinela danmoniensis Leach.

? *Rocinela Danmoniensis* Leach, Dict. sc. nat. XII, p. 346 (test. Sch. & Mein.).
! 1879. — — Schiødte & Meinert, op. cit. p. 383; Pl. XI, figs. 1—16.
! 1897. — *danmoniensis* G. O. Sars, Account, II, p. 65; Pl. 27.

Schiødte & Meinert recorded the length of females with marsupium to be 24—27 mm., but an ovigerous female from the "Ingolf" Stat. 44 is 30 mm. long, the same length as recorded by the authors named as the greatest for females without marsupium. — According to Sars it has been taken on "the skin of fishes of various kinds, for instance the common cod, the haddock, the ling, etc."

Occurrence. Captured by the "Ingolf" at two stations.

West of Iceland: Stat. 98: Lat. 65°38′ N., Long. 26°27′ W., 138 fath., temp. 5·9°; 1 spec.

South of Iceland: Stat. 54: Lat. 63°08′ N., Long. 15°40′ W., 691 fath., temp. 3·9°; 5 spec.

According to Schiødte & Meinert, and specimens later received by the Copenhagen Museum, this species has been gathered some times at or rather near the Færoes by various collectors, thus at Thorshavn and off Akraleite, ab. 150 fath. The "Thor" captured it at two places south-west of the Færoes, viz., in Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath., and Lat. 61°08′ N., Long. 9°28′ W., 435 fath.

Distribution. Taken at some places in Kattegat and the northern part of the Sound in depths from 4 to 16 fath. (H. J. Hansen); north of Kattegat in Lat. 56°54′ N., 26 fath. (Zirwas); at Väderöerne, west coast of Sweden, 80 fath. (Sch. & Mein.), and along the coast of Norway from the Christiania Fjord northwards at least to Trondhjem Fjord (G. O. Sars). Furthermore taken by the "Thor" north-east of Shetland, Lat. 61°31′ N., Long. 0°39′ W., 104 fath., and west of the Shetland Isles, 203 and 250 fath. (Norman); at Polperro and Plymouth in the Channel (Bate; Norman); west part of the Channel, west of Britany, and the inner, most southern part of the Bay of Biscay (K. Stephensen). In the three last-named localities it has been taken pelagic, with 25, 65 and 60 m. wire out. But when Stephensen, on the authority of Carus, mentions that it has been taken in the Mediterranean, it seems to me somewhat doubtful (on the authority of Marion, Carus recorded it from Marseille); several carcinological statements in Carus' book ought, until further evidence, to be discarded as based on a mere compilation of earlier and not infrequently erroneous determinations.

Rocinela maculata Sch. & Mein.

! 1879. *Rocinela maculata* Schiødte & Meinert, op. cit. p. 393; Pl. XII, figs. 10—12.
! 1885. — — Bovallius, Bih. K. Sv. Vet. Handl. Vol. X, No. 11, p. 10; Pl. II, figs. 18—23.
1905. — — Richardson, Monograph, p. 198.

This characteristic species was established on a male from Vladivostock. Bovallius described the ovigerous female; he had purchased two specimens "of the naturalist-merchant Wessel in Hamburg", and the locality was stated to be Greenland. The localities for specimens bought in such shops are not always trustworthy, but it is, on the other hand, not impossible that a species found at Vladivostock also belongs to the fauna of Arctic America and may live at West Greenland. This is the reason why the species it inserted here, but yet without number; I cannot follow Harriet Richardson, who without any reservation or doubt accepted it on the authority of Bovallius as belonging to the fauna of Greenland, and therefore to that of North America.

Syscenus Harger.

Only one species is known from the Atlantic.

120. Syscenus infelix Harger.

1880. *Syscenus infelix* Harger, Rep. U. S. Comm. Fish and Fisheries, Pt. VI, p. 387.
! 1883. — — Harger, Bull. Mus. Comp. Zool. Vol. IX, No. 4, p. 100; Pl. III, figs. 5—5 a, Pl. IV, figs. 3—3 h.
! 1897—1900. — — G. O. Sars, Account, II, p. 67; Pl. 28, and p. 247, Suppl. Pl. I.
1913. — — Stephensen, Rep. Dan. Ocean. Exped. No. 3. p. 10, fig. 3 (With synonymy).

Occurrence. Not taken by the "Ingolf". But in 1904 the "Thor" captured a larval specimen south-west of the Færoes in Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.

Distribution. It has been taken in the northern Kattegat, 23—28 fath., several times in Skager Rak more or less distant from the north coast of Jutland in depths from 37—45 to 106 fath., and off Cape Lindesnæs, 112 fath. (H. J. Hansen); besides off Bohuslän, on *Gadus merlangus* (Bovallius). Sars recorded it from the south coast of Norway, and the larvæ from two places, Hvitingsö and Bekkervig, on the west coast of the same country. Zirwas recorded it from Lat. 57°31′ N., Long. 7°27′ E., 114 fath.; Norman from Lat. 59°40′ N., Long. 7°21′ W., 516 fath., and La Bianco from Capri. Quite small specimens, measuring from 6 to 10 mm., have been captured pelagically in young-fish trawl five times in the western half of the Mediterranean (Stephensen). — Besides, it has been gathered several times at the east coast of North America or rather far from that country between Lat. 41°34′ N. and Lat. 38°50′ N., 80 to 640 fath. (Richardson). But when Richardson (1909) records it from the Sea of Japan: Lat. 35°06′05″ N., Long. 138°40′20″ E., I entertain strong doubt as to the correctness of the determination, and the authoress had, for the rest, "only one imperfect specimen".

Family Sphæromidæ.

Since, in 1905, my treatise: On the Propagation, Structure and Classification of the family Sphæromidæ (Quart. Journ. Micr. Sc. Vol. 49) was published, numerous papers dealing exclusively or partly with this family have been issued by various authors. Among these contributions several are important, some among them even voluminous, containing numerous descriptions of new or imperfectly known forms. All authors have adopted my classification, excepting Harriet Richardson as to a single genus to be mentioned presently. But I may perhaps insert here some remarks on the very few facts pointed out since 1905 as being of some significance for the classification, for the diagnoses of the family, of the sub-families, or of two of the sections of the group Sphærominæ platybranchiatæ.

One of the most important of the papers mentioned is E. G. Racovitza: Sphéromiens (Première Série) et Révision des Monolistrini, in Arch. Zool. Expérim. 5. Ser. Vol. IV, 1910, p. 625—758, Pls. XVIII—XXXI. It is mentioned because the author has discovered four plates of marsupial lamellæ in the section Monolistrini, the first pair originating at the base of first pair of legs. I had said that the family possessed three pairs of these plates, and most of the forms of the family possess only this number, but in *Bathycopea* Tatt. (*Ancinella* H. J. H.) I have now found a quite small pair at the first pair of legs, thus, four pairs in all. That some genera of Sphæromidæ possess four pairs of marsupial lamellæ is really interesting and is, I think, the only correction of any importance to be made in my diagnosis of the family, while nothing is to be altered in my diagnoses of the three subfamilies.

In the diagnosis of the group Sphærominæ platybranchiatæ I said that the exopods of fourth and fifth pairs of pleopods are unjointed, but I ought to have said that in the fourth pair the exopod is most frequently, and in the fifth pair always, unjointed. The discovery is due to Racovitza, but when he wrote that my diagnosis of that group "doit être modifiée sur le point suivant pour s'appliquer aux *Monolistrini:* Exopodites des pléopodes IV toujours avec articulation très nette, quoique souvent incomplète", he goes much too far, as he ought to have written that in one of the four sections, the Monolistrini, of that group the exopod in question is divided as he pronounced. — Finally, according to Racovitza the word "sometimes" shall be inserted in the diagnosis of the section Monolistrini in the sentence: "second pair [of legs] in the male terminating in a prehensile hand".

In my diagnosis of another section, the Ancinini, of the Sphærominæ platybranchiatæ the sentence "Mandibles without masticatory process" must be altered in the following way: Mandibles with the masticatory process reduced, very slender, nearly spine-shaped (see later on in the description of *Bathycopea*). Of the very interesting genus *Ancinus* M.-Edw. I had seen only an exsiccated specimen of *A. depressus* Say in the British Museum; I had examined its external features, but could not study the pleopods. In 1909 Harriet Richardson published a paper on *Ancinus depressus*, basing it on a female preserved in spirit. The authoress found that, while second pair of pleopods are biramous — as in other Sphæromidæ — the first pair consist of "a single branch furnished with long hairs"; the figure showing "first and second pleopod" is certainly not good, but I think that the statement, that first pleopods have only a single branch, is correct. But when the authoress thinks this character sufficient for separating *Ancinus* from the Sphæromidæ and therefore establishes it as the type for a family, the Anciniidæ, certainly extremely few Zoologists will adopt this unhappy view. A footnote in her paper (Proc. U. S. Nat. Mus. Vol. XXXVI, p. 173—177) runs as follows: "I prefer to retain *Ancinus* as the type and only genus of the family *Anciniidæ*, but those who desire to follow the classification of Hansen may accept the name *Sphærominæ colobranchiatæ* for a fourth group to include this form". But as *Ancinus* is closely allied to *Bathycopea* Tatt. and *Tecticeps* Richardson in every other feature of any importance, all sound classification must arrange *Ancinus* together with these genera as the section Ancinini among the Sphærominæ platybranchiatæ. That the first pair of pleopods are uniramous is only a very interesting generic character, which besides ought to be recorded as an exception in the characterization of the whole family as given p. 97—98 in my paper quoted.

Only two species of this very rich family have hitherto been found in the "Ingolf" area, and they belong to two sub-families, viz., the Limnoriinæ and the Sphærominæ.

Limnoria Rathke.

Only one species is known from our area.

121. **Limnoria lignorum** Rathke.

1799. *Cymothoa lignorum* Rathke, Skrivt. af Naturh. Selsk., V, p. 100; Pl. III, fig. 14.
! 1897. *Limnoria lignorum* G. O. Sars, Account, II, p. 76; Pl. 31.
1905. — — Richardson, Monograph, p. 269, figs. 279—281.
1914. — — Chilton, Ann. Mag. Nat. Hist. Ser. 8, Vol. XIII, p. 380—388.

Occurrence. Not taken by the "Ingolf". But some specimens have been captured by Dr. A. C. Johansen at Reykjavik, west coast of Iceland; besides, I have seen a good number of specimens secured by Cand. mag. Sæmundsen at Iceland, and probably also near Reykjavik. — It occurs at the Færoes, as the Physician F. Jørgensen has presented the Zoological Museum with a piece of wood containing many specimens and found at Trangisvaag, 1—3 fath.

Distribution. Taken in the Kiel Bay, at places on the east coast of Jutland, at the west coast of Sweden near Göteborg, in Christiania Fjord and at the Lofoten Island; at Great Britain, Holland and France; in the Adriatic and the Black Sea (various authors). Furthermore known from the east coast of North America from the Gulf of St. Lawrence and Halifax (Nova Scotia) to Florida, and H. Richardson has also put together information on its occurrence at the Bering Island and at San Diego, California. Tattersall has seen a specimen from Port Stanley, Falkland Islands, and Stebbing recorded it from Port Elisabeth in South Africa. Chilton has seen specimens from Auckland harbour, Lyttelton and Akaroa harbours, and he says that Whitelegge recorded it from Sidney and another Australian locality. Chilton's opinion that it has been introduced into such harbours in the southern hemisphere by wooden vessels is certainly correct.

Bathycopea Tattersall.

Description. Body much depressed, expanded laterally and broadly oval. — The head somewhat small. Eyes, if present, very small, feebly developed and a little removed from the margin of the head. — Antennulæ inserted on the front end of the head; their basal joint (Pl. XIV, figs. 7 a and 7 b) much produced as a large plate almost as broad as long and entirely visible from above; third joint long and slender; flagellum with more joints in the male than in the female. Epistome (fig. 7 a) produced into an oblong-triangular process reaching about to the middle of the inner margin of first antennular joint. — Mandibles (figs. 7 c and 7 d) with the part beyond the anterior condylus much produced, long, rather slender and forming a pronounced and not very obtuse angle with the basal half; movable lobe of left mandible well developed, slender, and before it a single seta; molar process of both mandibles long, somewhat compressed and very slender, with the end acute and a few incisions forming minute teeth on the distal half of its posterior margin. — Maxillulæ (fig. 7 e) with the inner lobe very short, reaching about to the middle of the outer lobe and feebly developed. Maxillæ (fig. 7 f) have the inner lobe small and, seen from below, covered by the inner branch of the outer lobe; the inner lobe is subtriangular, and its narrow end has a couple of small setæ; the two branches of the outer lobe are broad, distally cut off with well developed setæ on their terminal margin. — Maxillipeds (fig. 7 g) very characteristic and similar in both sexes; second joint rather large and extremely broad; lobe on fourth joint broad and low; fifth joint broad but a real lobe not developed, and sixth joint without lobe; an epipod could not be discovered.

Thorax with the epimera broad. — First pair of legs in both sexes with a large, oval, prehensile hand (fig. 7 i); second pair in the female like the following pairs, but in the male (fig. 7 h) with a slender and peculiarly shaped hand much smaller than in first pair; the other legs (fig. 7 l) are simple, slender, with the claw somewhat short and thin and no auxiliary claw.

The abdomen shows two short proximal segments immovably coalesced but well defined, and the anterior possessing "epimeral" plates. Last segment triangular, with the end not incised or produced, and the lateral part of the wall not bent inwards on the ventral side. — Both rami of the three anterior pairs of pleopods (Pl. XV, figs. 1 a—1 c) with marginal setæ, and, besides, undivided excepting the exopod of third pair, which has a well developed, oblique articulation; both rami of fourth and fifth pairs (figs. 1 d and 1 e) undivided, branchial, and without vestige of transverse folding; endopod of fourth pair terminating in a seta; exopod of fifth pair with the usual marginal or submarginal protuberances or bosses feebly developed, without spines. Appendix masculina inserted at the base of second endopod (fig. 1 b), distally very slender and frequently difficult to see, as in normal position it is nearly hidden in a very pronounced furrow on the inner, much thickened margin of the endopod. — Uropods with the sympod directed outwards and somewhat forwards; exopod very long, flattened, somewhat narrow.

The incubatory chamber is most peculiar; its major posterior part is formed by a single external and exceedingly large pouch with a very broad aperture directed forwards, while the anterior part of the chamber is formed by the marsupial lamellæ, of which the three posterior pairs are well developed, while the pair originating at first pair of legs are quite small; the whole ventral wall of the incubatory chamber is very pellucid.

Remarks. The main points of this description have been extracted from my former paper, but many particulars, especially on the mouth-parts, have been added, and two corrections have been made, viz. the existence of the molar process on the mandibles and of the appendix masculina (both mentioned by Tattersall).

Bathycopea Tatt. and *Ancinella* H. J. H. are synonyms, and both were established in papers published in 1905, but Tattersall had the name without description published in Rep. Brit. Assoc. Adv. Sc. 1904, and his name must be applied. He referred the genus to his new family Anciniidæ, of which he gave a long diagnosis. But I do not believe that he would have established this family, if he had possessed an extended knowledge of the numerous and partly peculiar genera of the Sphæromidæ, and now, after my paper from 1905, I think it superfluous to discuss the question on the affinities of *Bathycopea* and its place in the system. It can scarcely be questioned that either his family Anciniidæ must be cancelled or, what in my opinion would be very unfortunate, the Sphæromidæ as limited by me be divided not into two or three but into a good number of families.

122. **Bathycopea typhlops** Tattersall.

(Pl. XIV, figs. 7 a—7 l; Pl. XV, figs. 1 a—1 e).

1904. *Bathycopea typhlops* Tattersall, Rep. Brit. Assoc. (nomen nudum).
! 1905. — — **Tattersall, Isopoda, p. 12; Pl. III, figs. 1—13.**
1905. *Ancinella profunda* H. J. Hansen, Quart. Journ. Micr. Sc. Vol. 49, Pt. I, p. 132.

Tattersall published a good figure and a very elaborate description of this animal. Some particulars may yet be mentioned here.

Eyes generally wanting, but in a male I found an eye composed of three well developed facets on the right side a little from the antero-lateral margin, but no left eye. — Tattersall described the antennulæ, but he did not observe that the flagellum shows sexual difference, and he evidently described those of the female. He said that the peduncle has four and the flagellum seven joints, but this mode of counting is incorrect, as more than three joints cannot be ascribed to the peduncle in any Isopod. Thus we get eight joints in the flagellum, but in the female (fig. 7 b) I found nine, the eighth being very short, seventh and eighth very slender, the ninth extremely thin. In the male (fig. 7 a) the antennulæ are conspicuously longer than in the female; the flagellum has eleven joints, and the three distal shaped completely as in the female. — The flagellum of the antennæ is similar in both sexes; Tattersall stated it to be five-jointed, but in ovigerous females and adult males (fig. 7 a) I found nine joints, the three distal very slender and small.

Tattersall wrote: "*Labrum* produced somewhat acutely into a process underlying the rostrum". This I cannot understand. Labrum (fig. 7 a, *l*) is transverse, very movable and, as might be expected, without any trace of process. — What Tattersall mentioned as "a spine serrated distally on one edge" on the mandible is in reality the peculiar molar process (fig. 7 d), and it is not articulated to the *corpus mandibulæ*.

The prehensile hand of first pair of legs (figs. 7 i and 7 k) does not seem to show any constant sexual difference. The hand on second pair (fig. 7 h) in the male is interesting; sixth joint is very oblong and on the lower margin armed with some four processes shaped as thick spines with extremely fine hairs at the end and a conspicuous seta inserted before the end; seventh joint is long, considerably curved, of about the same breadth to the rounded end and without claw.

Last abdominal segment at the base considerably less broad than the broad but very short anterior section of the abdomen; the upper surface of the last segment has a raised semicircular ridge laterally rather remote from, but subparallel with, the lateral margin, and at the median line a little longer from the posterior end than from the anterior margin; parallel with and rather near to the whole lateral and posterior margin is found a sublinear impression; the margin itself is finely serrate. — Exopod of uropods reaches in adduced state slightly beyond the abdomen; it is rather narrow, flat, somewhat curved inwards, and especially on its outer margin finely serrate; its end is bifid, with the inner process several times smaller than the outer.

Length of the male 4—4·3 mm., of the ovigerous female 4·7 mm.; Tattersall recorded 5 mm. for both sexes.

Occurrence. This most interesting form has not been taken by the "Ingolf", but the "Thor" gathered it at two places.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; many spec.

— - - — Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; many spec.

Distribution. Taken at five places west of Ireland in depths from 199 to 454 fath. (Tattersall).

Family Anthuridæ.

This family, which occupies a rather isolated position, comprises a somewhat small number of forms. Our knowledge of the family is still somewhat imperfect, as several of the species seem to be rare, and the mouth-parts are very difficult to study. My material from our area is small, comprising only two species belonging to two genera, while a third species (and genus) had been taken by the "Valorous". The most important paper on the Anthuridæ from the North Atlantic is by A. M. Norman and T. R. R. Stebbing: On the Crustacea Isopoda of the 'Lightning', 'Porcupine', and 'Valorous' Expeditions. I. (Trans. Zool. Soc. London, Vol. XII, Pt. IV, 1886).

In the genera examined here, *Cyathura* and *Calathura*, the females have only three pairs of marsupial lamellæ belonging to third, fourth and fifth segments; no vestige of such plates could he discovered on second segment. If this number of lamellæ is found in all genera, it would afford an interesting character for the family. — Thienemann has discovered statocysts in the telson of *Anthura gracilis* (according to Gurney identical with *Cyathura carinata* Kr.) and in another species. In *Cyathura truncata* n. sp. they are easily found in the telson, lying below the dorsal wall at a short distance from its base (Pl. XV, fig. 2 q, *s*); each statocyst contains a single rather large statolith (fig. 2 r), but the duct from the statocyst to the surface was not looked for. In *Calathura brachiata* a single impaired statocyst is observed near the base of the telson (fig. 3 a, *s*); it is a somewhat large, oval, transverse vesicle with a single duct directed upwards, consequently not visible in fig. 3 a; the wall of the vesicle is so well chitinized that it is easy to take it out, but the vesicle of the two specimens examined did not contain any large statolith, but towards its lateral margins at each side several small or extremely small crystals. Whether statocysts are found in other genera is unknown.

The mouth-parts are extremely difficult to study, and the descriptions and figures in the literature are frequently deficient as to various particulars, so that several statements ought to be applied with caution.

Cyathura Norman & Stebbing.

The type is *C. carinata* Kröyer. Its mouth-organs have been studied by Schiødte (1875) and by Norman & Stebbing (1886), but a few corrections may be given for comparison with the structure in my new species *C. truncata*. Norman and Stebbing described and figured the maxillipeds as three-jointed, but they have overlooked the basal joint and the epipod; Schiødte overlooked the basal joint and figured the epipod, but interpreted it wrongly. The authors have overlooked the inner lobe of the maxillulæ, which is developed as in *C. truncata* to be described presently; as to the maxillæ these must be very reduced or wanting, and the organ described by Schiødte as the maxillæ is in reality a part of the paragnatha.

The generic characters may be pointed out. The antennulæ (fig. 2 a) have the flagellum reduced, two-jointed, the terminal joint tiny. The antennæ have the peduncle five-jointed, with second joint large, but whether this joint is formed by the fusion of two joints cannot be decided; the flagellum in the females is moderately short or very short (in *C. carinata* it seems in the females to consist of a single small joint, but a closer examination under high magnifying power revealed that joint as subdivided into four joints, the three distal extremely short). Labrum rounded. Mandibles with some rounded teeth on the cutting edge, and behind that edge a large plate with the thin and convex inner margin distinctly or—in *C. truncata* (fig. 2 c) — indistinctly serrate. Paragnatha (fig. 2 d) with the two lobes obtuse and setiferous, the median lobe broad and distally emarginate. Maxillulæ (figs. 2 e and 2 f) with the inner lobe distinct, short, terminating in a narrow free part with an apical seta, the outer lobe with the oblique end produced into several slender, spiniform processes. Maxillipeds (fig. 2 g) five- or (in *C. carinata*) four-jointed; the basal joint with its epipod well developed. — Second pair of thoracic legs (fig. 2 k) feebly prehensile, as the sixth joint decreases a little in depth from near the base to the end, with its lower margin a little concave. Seventh thoracic segment short. — Abdomen short, with the five anterior segments coalesced on the median part of the upper surface (fig. 2 m). First pair of pleopods (fig. 2 n) have the exopod developed as a large, solid plate covering the narrow endopod and the other pleopods; second pair (fig. 2 o) with both rami unjointed, but the exopod has a vestige of a division at the outer margin. Uropods broad; the exopod (fig. 2 p, *ex*) is a large, oblong plate. Telson (fig. 2 q) oblong, somewhat ovate, with a pair of statocysts beneath the dorsal wall a little from the base.

Of the two northern species known to me only *C. truncata* n. sp. has been found in the "Ingolf" area. When Norman & Stebbing in enumerating the geographical distribution of *C. carinata* wrote: "Greenland (Kröyer)", this must certainly, as already suggested by Meinert, be due to some misunderstanding; Harriet Richardson (1905) reproduced this error of the English authors. — The females of the two species may be separated by this key.

Antennal flagellum consists of a joint (subdivided into four joints) much shorter than the terminal joint of the peduncle. Mandibles with the inner margin of the incisive plate strongly serrate. Maxillipeds four-jointed. Telson terminates in an obtuse angle. *C. carinata* Kröyer.

Antennal flagellum at least as long as the terminal joint of the peduncle, seven-jointed, but the five distal joints very slender and short. Mandibles with the inner margin of the incisive plate showing a few vestiges of serration. Maxillipeds five-jointed. Telson with the end truncate.

C. truncata n. sp.

123. **Cyathura truncata** n. sp.

(Pl. XV, figs. 2 a—2 r).

Female (without marsupium). Slender, generally more slender than *C. carinata*. No eyes. Antennulæ with first joint of the peduncle (fig. 2 a) as long as, but much thinner than, third joint; terminal joint quite small and thin. Antennæ (figs. 2 a and 2 b) slightly longer than the head; flagellum at least as long as last joint of the peduncle, seven-jointed, with the first joint much longer and thicker than the second, which is much longer and thicker than the third, while the distal joints are very short and very slender. Maxillipeds five-jointed (fig. 2 g); third and fourth joints combined corresponding to third joint in *C. carinata*.

Seventh thoracic segment less than half as long as the sixth. First pair of thoracic legs (figs. 2 h and 2 i) in the main as in *C. carinata*; the hand has no protruding angle on the prehensile margin, but is only somewhat convex and rounded before the middle; seventh joint has the prehensile margin set with a row of obtuse saw-teeth, and is well marked off from the long claw. The six posterior pairs of legs a little more slender than in *C. carinata*; second pair (fig. 2 k) with the sixth joint feebly curved and decreasing a little in depth from near the base to the end; seventh pair (fig. 2 l) differ materially from those in *C. carinata* in having the fifth joint much longer, only a little shorter than fourth joint, while the sixth joint is considerably shorter than the two preceding joints combined, somewhat slender and minutely crenulate on the lower margin.

Telson (fig. 2 q) distinctly more than twice as long as broad, truncate with the terminal margin straight, and a little less than half as long as the breadth of the telson a little before its middle. — Uropods (figs. 2 m and 2 p) in the main as in *C. carinata*, but the exopod is longer, slightly more than half as long again as broad.

Length of the largest specimen (perhaps not full-grown) 10 mm.

Occurrence. Taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2·4°; 5 spec.
— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1·5°; 2 spec.

Anthelura Norm. & Stebb.

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

124. **Anthelura abyssorum** Norman & Stebbing.

1886. *Anthelura abyssorum* Norman & Stebbing, op. cit. p. 127; Pl. XXVII, fig. 2.

Occurrence. I have not seen any specimen. But it was taken by the "Valorous" in 1875 at the following place.

South of Davis Strait: Lat. 59°10′ N., Long. 50°25′ W., 1750 fath. (Norm. & Stebb.)

Calathura Norm. & Stebb.

This genus has been well characterized by the English authors and by G. O. Sars. — It may be emphasized that in the maxillipeds the first joint has completely disappeared, as already figured by Sars. As to the statocyst in the telson see above p. 180.

125. Calathura brachiata Stimpson.

(Pl. XV, fig. 3 a).

1854. *Anthura brachiata* Stimpson, Smiths. Contrib. to Knowl., VI, 1853, p. 43.
1878. — *arctica* Heller, Denksch. math. natur. Classe der Kais. Akad. Wiss. Vol. XXXV, p. 38; Pl. IV, figs. 9—12.
! 1886. *Calathura brachiata* Norman & Stebbing, op. cit. p. 131; Pl. XXVI, fig. 1.
! 1897. — — G. O. Sars, Account, II, p. 46; Pl. XIX, fig. 2.
! 1897. — *norvegica* G. O. Sars, op. cit. p. 45; Pl. XIX, fig. 1.

This species varies extremely as to size, and the largest specimens are from cold localities. I have compared a few large specimens with the somewhat small specimens from the "Ingolf" Stat. 32, with the temperature 3·9°, and at first I thought I had found a difference in the shape of the telson, which is narrower and more produced in the large specimens, but afterwards I found pronounced variation among the specimens from Stat. 32. A female with young in the marsupium from this locality is 16·8 mm. long, another female with marsupium 18 mm., and the largest of the 41 specimens is 21 mm. A specimen from the "Ingolf" Stat. 126, temp. ÷ 0·5°, measured 39 mm., while my largest specimen, taken in Scoresby Sound, East Greenland, 5—25 fath., is 45·5 mm.; Ohlin had a male measuring 43 mm.

I have examined a co-type of *C. norvegica* G. O. S. presented by Sars, but was unable to see the differences between this form and *C. brachiata*. Especially one of the dorsal impressions was well developed, and the eyes seemed to be not more indistinct than in many specimens of *C. brachiata*; probably both are blind, as no vestige of facets can be discovered. According to Sars, the adult female of *C. norvegica* is 12 mm. long, but in spite of the difference in size I must agree with Ohlin and Stappers, who after a careful examination cancelled *C. norvegica*. — On the statocyst (fig. 3 a) see p. 180.

Some fifteen years ago I discovered in the marsupium of three specimens from Forsblad Fjord, East Greenland, a most interesting parasite, which I believed must be an unknown genus of Cirripedia Rhizocephala. Some years afterwards Dr. Geoffrey Smith worked out this material and found that the parasite was a very aberrant type of Rhizocephala, and he established it (1906) as *Duplorbis Calathuræ* G. Smith.

Occurrence. Taken by the "Ingolf" at thirteen stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 41 spec.
— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3·6°; 1 spec.
Denmark Strait: Stat. 95: Lat. 65°14′ N., Long. 30°39′ W., 752 fath., temp. 2·1°; 1 spec.
— — Stat. 96: Lat. 65°24′ N., Long. 29°00′ W., 735 fath., temp. 1·2°; 1 spec.
West of Iceland: Stat. 85: Lat. 63°21′ N., Long. 25°21′ W., 170 fath.; 3 spec.
South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4·5°; 11 spec.

South of Iceland: Stat. 54: Lat. 63°08′ N., Long. 15°40′ W., 691 fath., temp. 3·9°; 1 spec.
— - — Stat. 55: Lat. 63°33′ N., Long. 15°02′ W., 316 fath., temp. 5·9°; 1 spec.
South-East of Iceland: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5°; 4 spec.
North of the Færoes: Stat. 144: Lat. 62°49′ N., Long. 7°12′ W., 276 fath., temp. 1·6°; 5 spec.
North of Iceland: Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0·6°; 1 spec.
— - — Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 2 spec.
South of Jan Mayen: Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 2 spec.

Furthermore *C. brachiata* has been gathered by various collectors at a good number of places in most parts of our area. Off West Greenland it has been taken several times from Lat. 72°20′ N., Long. 59°39′ W., southwards to Lat. 66°22′ N., Long. 57°16′ W., in depths from 122 to 364 fath. (H. J. Hansen, Stephensen), and in Brede Fjord, ab. Lat. $61^{1}/_{3}$° N., 164—175 fath. (Stephensen). — At East Greenland it has been taken many times between Lat. 69°25′ N. and Lat. 75°59′ N., in from 5—25 to 191 fath.; most of the places are to be found in Stephensen's Conspectus, but the following localities, where it has been secured by the IInd Amdrup Exped., may be added here: Near Stewart Land, ab. Lat 70°30′ N., 158 fath., 1 spec.; Hurry Inlet, Lat. 70°50′ N., 50 fath., 1 spec.; Forsblad Fjord, Lat. 72°17′ N., 50 fath., 2 spec.; ab. Lat. 74°20′ N, Long. 17° W., 110 fath., 3 spec. — Off Jan Mayen it has been taken by G. O. Sars in 195 fath. and by Ohlin in 677 fath.

Admiral Wandel secured this species north of Iceland in the Skagestrand Bay, 119 fath., temp. 2·9°, and east of Seydis Fjord, East Iceland, 135 fath.; Sars recorded it from a locality east of Iceland, 299 fath., temp. ÷ 0·3°. The "Thor" has taken it at two places south of Iceland, viz. Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath., and Lat. 62°57′ N., Long. 19°58′ W., 508 fath.; and, besides, south-west of the Færoes in Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.

Distribution. *C. brachiata* has a wide and most interesting distribution outside the "Ingolf" area. Taken off Norway in Lat. 58°22′ N. (Zirwas), and in three places at West Norway (G. O. Sars) in 150 to 200 fath.; in Bög Fjord, Porsanger Fjord, Varanger Fjord and off Vardö, 100 to 148 fath. (G. O. Sars, Norman); between Norway and Beeren Eiland at five places, from 186 to 244 fath. (G. O. Sars, Ohlin); from Beeren Eiland northwards and at many places off or near Spitsbergen, in depths from 10 to 231 fath., temp. from 2·8° to ÷ 1·71° (G. O. Sars, Ohlin); in the Barents Sea at nine places, 65 to 177 fath. (Hoek, Weber); Murman Sea, 76 fath. (Stebbing); at Novaya Zemlya and in the Kara Sea, from 30 to 80 fath. (Stuxberg, Hansen, Stappers), and between Novaya Zemlya and Franz Joseph Land, 117 fath. (Heller). Besides taken north of Shetland, 263 fath. (Zirwas); between Shetland and the Færoes, and southwards, west of Scotland and Ireland, to far west of Britany, Lat. 48°38′ N., in depths from 199 to 1360 fath. (Norman & Stebbing; Tattersall). — Furthermore it has been taken at the west coast of Baffin Bay in Lat. 72°08′ N., 10—28 fath. (Ohlin); off Nova Scotia and at other places off the east coast of North America southwards to ab. Lat. 41°20′ N. (Richardson).

Sub-Order *Valvifera.*

Of the five families established only two, viz. Idotheidæ and Arcturidæ, are represented in the material. In large forms of both families I have in vain looked for a præcoxa and a squama on the antennæ, and for a præcoxa in the maxillipeds. But these mouth-parts differ somewhat in the two sexes, as in ovigerous females the coxa has always a lappet directed backwards evidently in order to produce a current of water to eggs and young.

When comparing the proximal parts of the maxillipeds of the males of *Mesidothea Sabini* Kr. (Pl. XV, fig. 4 a) and *Astacilla granulata* G. O. S. (fig. 9 a), both chosen as representatives for the two families, it is seen that in *Astacilla* we find only the coxa and an undivided epipod (fig. 9 a), the basal part of which is marked off a little by the shape of the margins, while in *Mesidothea* three pieces are found (fig. 4 a), but a comparison with *Astacilla* shows that it must be the epipod, which has been divided into a large, transverse basal part (*b*) and a much larger distal part (*d*). Comparing the maxilliped of the ovigerous female *Mesidothea* (fig. 4 b) with that of the male, it is seen that the distal part (*d*) of the epipod is similar in both sexes, while its basal part (*b*) and the coxa (*1*) are much altered. In the female the coxa has its chitinous plate altered in shape, being at the outer side produced into a somewhat short anterior and a very long and very oblique, narrrow posterior lamella; at the inner side of the plate is seen a somewhat narrow and at its basal margin a rather large area of membranous skin, and these membranous parts constitute together a free lappet, which has the margins set with fine hairs. Furthermore the basal part of the epipod has been much enlarged, and its firm chitine is divided into a narrow strip at the coxa and two transverse much larger strips, while all intermediate parts are membranous. — Turning now to *Astacilla*, we find in the female (fig. 9 b) a somewhat similar structure. The coxa (*1*) has been produced much backwards as a somewhat long, free lappet; this lappet is well chitinized except along its lateral margins and at the end, where a few hairs are seen. But the epipod (*ep*), which is undivided in the male, is in the female divided into a major distal part answering to the male epipod except its most proximal part feebly marked off by the shape of the margins; in the female the proximal part of the epipod has two transverse, chitinized areas with a membranous strip between them, thus moderately similar to the structure in the female *Mesidothea*.

In the literature I have found no statement on these differences in the maxillipeds of the two sexes in Idotheidæ and Arcturidæ, excepting that Sars (Account, p. 87) has a single line on this sexual difference in *Astacilla*. Recent authors (Sars, Richardson, Stephensen) generally selected a large specimen for the dissection of the mouth-parts; as in Idotheidæ adult males are larger than the females, they have generally figured male maxillipeds, and as in *Arcturus* and *Astacilla* the females are generally much larger than the males, they have, what is really misleading, figured the female maxilliped with its well-sized proximal lappet as type for that limb in the species in question.

In *Arcturus Baffini* Sab. the first pair of pleopods have, seen from in front (Pl. XV, fig. 5 a), three joints in the sympod. First joint, *præcoxa* (*1*), is a strongly bent plate of considerable size touching the sternite and the triangular plate representing second joint (*2*), but it does not touch the proximal margin of third joint, while the plate representing second joint is articulated to the third firmly chitinized joint (*3*) and does not reach the sternite. The intervals between the firm parts are membranous.

Family Idotheidæ.

Three well-known genera are represented in the material.

Mesidothea Richardson.

The name proposed by Harriet Richardson must, I think, be preferred, as the animals differ materially both from *Chiridothea* Harg. and from the antarctic *Glyptonotus* Eights. Two species are known from our area.

126. **Mesidothea Sabini** Kröyer.

(Pl. XV, figs. 4 a—4 b).

? 1846. *Idothea Sabini* Kröyer, in Gaimard, Voy. in Scand., Crust. Pl. 27, fig. 1.
1847. — — Kröyer, Naturh. Tidsskr. Ny Række, Vol. II, p. 394, 401.
! 1882. — *Sabinei* Stuxberg, Vega-Exped. Vetensk. Iakttag. Vol. I, p. 716, with fig.
! 1905. *Mesidotea Sabini* Richardson, Monograph, p. 350, figs. 377—379.

The maxillipeds of both sexes (figs. 4 a and 4 b) are described on p. 185. — Some observations on the moulting, etc., are found in my paper on the Crustacea from "Dijmphna-Togtet" (1887), and Max Weber (1884) has studied the anatomy.

The largest specimen recorded is a male, 98 mm. long, from Northern Strömfjord, West Greenland (Stephensen).

Occurrence. Not taken by the "Ingolf". Within the "Ingolf" area only known from West Greenland, and recorded from the following localities: Lat. 76°09' N., 17—25 fath. (Ohlin); Lat. 76°07' N., 5—12 fath. (H. J. Hansen); some places in the inner part of Northern Strömfjord, Lat. 67°40' N., in depths from about 21 down to 173 fath., temp. from slightly above zero to ÷ 1·5° (Stephensen); finally Julianehaab, Lat. 60°43' N.

Distribution. This fine species has been taken at Ellesmere Land in Gaase Fjord, 10—15 fath. (G. O. Sars), and at Cape Faraday, Lat. 77°38' N., 5—10 fath. (Ohlin), furthermore at four places along the east coast of Arctic America from Lat. 73°43' N. to Lat. 66°33' N., 5—10, 6 and 10—15 fath. (Ohlin); it is known from Melville Peninsula and a couple of places on the north coast of Alaska (Richardson), perhaps also found at the west coast of North America (Miers). — Sars recorded it from a station between North-East Norway and East Spitzbergen: Lat. 73°25' N., Long. 31°10' E., 197 fath., temp. 2·2°; furthermore it has, according to Ohlin, been taken in the Storfjord, Spitzbergen. It has been taken several times in the Barents Sea in from 54 to 175 fath. (Hoek, Weber, Stebbing), was secured between Novaya Zemlya and Franz Joseph Land (Heller), is common in the Kara Sea, 8 to 100 fath. (Stuxberg, Hansen), and more eastward in the Siberian Polar Sea to Long. 170°17' E., 4 to 50 fath. (Stuxberg). But as it is unknown at East Greenland and Jan Mayen, in the most eastern part of the sea north of Siberia, and at least the western part of the Bering Sea, it can scarcely be called circumpolar.

M. Sabini has thus been taken in depths from 4 to 197 fath.; according to Stuxberg the temperature at the bottom was generally between ÷ 0·4° and ÷ 1·7°, while small specimens have been found in so high a temperature as 2·6°.

127. **Mesidothea megalura** G. O. Sars.

1879. *Chiridothea megalura* G. O. Sars, Arch. Math. og Naturv. Vol. IX, p. 432.
! 1885. *Glyptonotus megalurus* G. O. Sars, North-Atl. Exp. Crust. I, p. 112; Pl. 10, figs. 1–23.
1901. *Chiridothea megalura* Ohlin, Bih. K. Sv. Vet. Akad. Handl. Vol. 26, IV, No. 12, p. 24, figs. 4 a–4 d.

This species is closely allied to *M. Sabini*, but much smaller. My largest specimens (from Stat. 113) are a female with marsupium measuring 52 mm. and a male 51·3 mm. long. Ohlin's largest male was 56 mm. Ohlin has made a careful comparison between the two species and pointed out a few differences, one among them being found in the number of abdominal segments, and perhaps the best character being the conical process on the ventral side of seventh thoracic segment in *M. megalura*, while in *M. Sabini* I find a broad and low protuberance with a longitudinal excavation.

Occurrence. Taken by the "Ingolf" at three deep stations in the cold area.

Far south of Jan Mayen: Stat. 112: Lat. 67°57′ N., Long. 6°44′ W., 1267 fath., temp. ÷ 1·1°; 2 spec.
— — - — Stat. 118: Lat. 68°27′ N., Long. 8°20′ W., 1060 fath., temp. ÷ 1·0°; 4 spec.
— — - — Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 7 spec.

Distribution. Sars enumerated *M. megalura* from five places, all in the cold area but far from each other, in the sea between Norway—Spitzbergen in the East, while the western limit is a line from a little east of the Færoes to somewhat west of Spitzbergen, and between Lat. 63°17′ N. and Lat. 77°58′ N.; the depths from 1081 to 1710 fath., the temperatures from ÷ 1·0° to ÷ 1·4°. Ohlin recorded it from a place west of Spitzbergen, Lat. 78°19′ N., 1434 fath., temp. ÷ 1·4°. — The species is the most pronounced cold water form from the deep sea known to me among the Isopoda.

Idothea J. C. Fabricius.

In 1894–1895 Ad. Dollfus published a valuable treatise: Les Idoteidæ des côtes de France, in Feuille des Jeunes Naturalistes, III. Ser. 25e Année, which ought to be consulted together with Sars' work. In the following a separate copy is quoted.

Five well-known species are represented in the material.

128. **Idothea balthica** Pallas.

1772. *Oniscus Balthicus* Pallas, Spic. Zool. IX, p. 67; Pl. IV, fig. 6.
! 1894. *Idotea tricuspidata* Dollfus, l. c., p. 7, figs. 1–9, fig. 10 B, fig. 19.
! 1897. *Idothea baltica* G. O. Sars, Account, II, p. 80; Pl. 32.
1905. — — Richardson, Monograph p. 364, figs. 394–395 (with enormous synonymy).

The description given by Pallas leaves no doubt as to the species examined. The largest specimen from our area seen by me is a male from Reykjavik, and it is 36·5 mm. long, but an old Kröyerian specimen from Northern Norway is 41·5 mm.

Occurrence. Taken by the "Ingolf" both at the northern and the southern part of the west coast of Iceland, viz., in Dyre Fjord and at Reykjavik.

This species does not occur at Greenland. It has never been taken at the north, east and south coasts of Iceland, but several times along the whole west coast, viz. in Höfn Bay, Adelvik, Skutils Fjord, Ønundar Fjord, Faxe Fjord and at Reykjavik, from the beach down to 10—11 fath. (various collectors). It is very common at the Færoes, where it has been taken in Trangisvaag, Kalbak Fjord, Kvannesund, at Thorshavn, Vestmanhavn, etc.

Distribution. This species is known from the Baltic, going to near Stockholm's skärgård and the coast of Finland, from the Sound, the Danish Belts and Kattegat, along Norway at least to Tromsø, in the North Sea on floating wood or algæ (Zirwas), at Holland, Great Britain and Ireland, Northern and Western France, the Mediterranean and the Black Sea (many authors), besides west of El Araish, Morocco (Copenhagen Museum). In the West Atlantic it is recorded as occurring from the Gulf of St. Lawrence and Nova Scotia to North Carolina, and, besides, at Bermudas and Barbadoes (Richardson). But when Richardson furthermore enumerated it from Desterro and Rio de Janeiro, from New Zealand, the Red Sea and Java, I think that at least most of, and probably all, these statements are incorrect; in Miers' monograph of the family (1883) I find all these localities enumerated for his *I. marina* L., which renders Richardson's copying them worse than valueless, as Miers under the name *I. marina* had mixed up at least four and probably five or six species. The same authoress also said the depth to be from the "surface to 119 fathoms", but the latter statement is certainly misleading, being due to the fact that the animals, which can swim rather well and frequently live among floating algæ, have been taken in the instrument when it was hauled up.

129. **Idothea granulosa** Rathke.

1843. *Idothea granulosa* Rathke, Nova Acta Acad. Cæs. Leop. Cur. XX, p. 23.

1895. *Idotea marina* Dollfus, l. c. p. 7, fig. 22.

! 1897. *Idothea granulosa* G. O. Sars, Account, II, p. 82; Pl. 34, fig. 1.

! — — *neglecta* G. O. Sars, l. c. p. 84; Pl. 35, fig. 1.

Both Norman and Tattersall have followed Sars in keeping *I. neglecta* as a species separate from *I. granulosa*, but after prolonged examinations of my rich material, which even comprises co-types of both forms presented by Sars, I must consider them as varieties of the same species, which is very variable in the shape of abdomen, in granulation, in the length of appendix masculina in large specimens, in colour, etc., so that I have been quite unable to refer my specimens to two species. From the Færoes my largest male is 27·2 mm. long; its abdomen is shaped as in *I. neglecta* Sars, its surface is smooth, but the appendix masculina is longer than according to Sars, being as long as in his figure of *I. emarginata*. Another male is 24·5 mm. long, the shape of abdomen intermediate between *I. granulosa* and *I. neglecta* as figured by Sars, the surface smooth excepting on the epimera and the most lateral parts of the segments, where it is somewhat scabrous, the appendix masculina about as in the preceding specimen. A third male from the Færoes is 22·5 mm.; its abdomen is shaped as in the typical *granulosa* Sars; nearly the whole surface is smooth, and the appendix masculina reaches the end of the endopod. Thus the appendix masculina in these three very large males is intermediate in length between those in *I. granulosa* and *I. neglecta* as figured by Sars. These remarks may be sufficient.

Occurrence. Taken by the "Ingolf" at the north-west coast of Iceland in Isafjord, in shallow water, and at the Færoes in Trangisvaag, between algæ at the beach.

It has been captured several times at the west coast of Iceland, viz. in Adelvik, in Skutils Fjord, and several times near Reykjavik, at the shore and down to $1^{1}/_{2}$ fath. (various collectors, and among them G. O. Sars, who in the North-Atl. Exped. Crust. II, p. 30 said that *I. pelagica* had been taken by himself at Reykjavik, but in his "Account" referred his earlier *I. pelagica* Leach to *I. neglecta*). Furthermore it has been gathered by Dr. A. C. Johansen south of Iceland at the Vestman-Islands on the beach. From the Færoes our Museum possesses many specimens; of special localities only Vestmanhavn, Klaksvig and Thorshavn have been noted.

Distribution. This species is known from Denmark (H. J. Hansen) and occurs along the whole coast of Norway from Christiania Fjord to Vadsø. It is known from various places at Scotland, England, Ireland, Jersey and Guernsey (A. M. Norman, Tattersall). As to France Dollfus stated it to be "très commune sur toutes nos côtes océaniques"; from the Mediterranean it seems to be unknown.

130. **Idothea emarginata** J. C. Fabricius.

1793. *Cymothoa emarginata* J. C. Fabricius, Entom. Syst. II, p. 508.
! 1895. *Idotea* — Dollfus, l. c. p. 6, fig. 18.
! 1897. *Idothea* — G. O. Sars, Account II, p. 85; Pl. 35, fig. 2.

The largest specimen, a male from Kvalbø, one of the Færoes, is 32 mm.

Occurrence. Taken by the "Ingolf" in the Dyre Fjord, north-west coast of Iceland.

Furthermore it has been gathered at some other places on the west coast of Iceland, viz., Höfn Bay, 10 fath., and Adelvik, 9 fath. among *Laminaria* (by Mag. W. Lundbeck), and in large numbers at Reykjavik. At the Færoes it has been found a few times, and the localities noted are Vaagö, 2—5 fath. (by the "Thor"), and $3^{1}/_{2}$—0 fath. (by Mag. A. Ditlevsen), Sandö (by Dr. Th. Mortensen), and Kvalbö (by Cand. A. Fjelstrup).

Distribution. This well-known species has been recorded from the northern part of the Sound and several places in Kattegat, 3—9 fath. (H. J. Hansen). It occurs along the whole coast of Norway, going down to about 20 fath. (G. O. Sars); was found in the North Sea, 46 fath. (Zirwas); at many places in Great Britain and Ireland (Norman, Tattersall); at Jersey (Koehler); is rare at the west coast of France, goes southwards to Algeria, and was taken at Marseille (Dollfus).

131. Idothea pelagica Leach.

1815. *Idotea pelagica* Leach, Transact. Linn. Soc. Lond. XI, p. 365.
! 1895. — — Dollfus, l. c. p. 8, fig. 23.
! 1897. *Idothea* — G. O. Sars, Account, II, p. 81; Pl. 33.

Occurrence. Not found by the "Ingolf". But it has been taken twice at the Færoes, viz. in Kröyer's time, and by Cand. mag. H. Jönsson in 1897 at Thorshavn, on *Laminaria hyperborea*; furthermore a specimen was captured by Commodore Caroc, 1—4 miles west of Snefjeldsjökel, West Iceland.

Distribution. This clumsy species seems to be somewhat scarce. It has been taken at Lillesand, south coast of Norway, close to the shore among algæ (G. O. Sars), and at Christianssund on the west coast (Rathke). Furthermore it has been recorded from Aberdeen (T. Scott), St. Andrews (Collinge), West and South-West Ireland (Tattersall, Norman), some places on the north and west coasts of France (Dollfus).

132. Idothea metallica Bosc.

1802. *Idothea metallica* Bosc, Hist. Nat. Crust. Vol. II, p. 179; Pl. 15, fig. 6.
! 1846. — *robusta* Kröyer, Naturh. Tidsskr., Ny Række, Vol. II, p. 108.
? — — Kröyer, in Gaimard Voy. en Scand., Crust. Pl. 26, figs. 3 a—3 r.
1883. *Idotea metallica* Miers, Journ. Linn. Soc. Lond., Zool., Vol. 16, p. 35.
! 1895. *Idothea* — H. J. Hansen, Ergebn. der Plankton-Exped., Vol. II, G, c. p. 10; Pl. I, fig. 3.

Occurrence. This purely oceanic species has not been taken by the "Ingolf". But many years ago some specimens were captured in Davis Strait in Lat. 64°46′ N., Long. 53°35′ W. (H. J. Hansen). Kröyer's specimens of his *I. robusta*, which have not been preserved, had been taken between Iceland and Greenland at about Lat. 60° N.

Distribution. Recently Dr. Collinge indirectly suggested that he has from Scotland a species allied to *I. metallica*. It may be possible that several among the specimens referred by some authors to *I. metallica*, or to forms later considered as synonyms, in reality belong to a hitherto unrecognized species, but as my northern specimens belong to the form figured by me as *I. metallica* in the paper quoted, I did not wish to investigate here the question and the enormous literature, especially as many points cannot be decided without the examination of specimens preserved in some large foreign Museums. *I. metallica* seems frequently, or perhaps generally, to attach itself to objects floating in the sea, as *Fucus*, Sargasso, objects with colonies of barnacles, etc. It is distributed in the whole Atlantic excepting the colder northern and southern areas, and the specimens recorded above from the "Ingolf" area were certainly occasional visitors brought so far northwards on floating objects. Furthermore the species occurs in the Indian Ocean, and in the tropical and warmer temperate parts of the Pacific.

Synidothea Harger.

Only a single species is hitherto known from our area.

133. Synidothea nodulosa Kröyer.

! 1846. *Idothea nodulosa* Kröyer. Naturh. Tidsskr. Ny Række, Vol. II, p. 100.
? — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. 26, figs. 2 a—2 v.
! 1880. *Synidothea nodulosa* Harger, Rep. U. S. Comm. Fish and Fisheries, Pt. VI, p. 351; Pl. VI, figs. 33—35.
1905. — — Richardson, Monograph, p. 388, figs. 429—430.

In the marsupium has been found the Epicarid *Clypeoniscus Meinerti* Giard & Bonn., to be dealt with later on.

Occurrence. This fine form has not been taken by the "Ingolf".

It has been captured three times at West Greenland, viz., at Godhavn, Lat. 69°14′ N., 8—10 fath., sand; at Lat. 66°46′ N., Long. 54°10′ W., 18 fath., stones with many Balani (H. J. Hansen), finally at "Southern Greenland", 12—15 fath., sand (Kröyer).

Distribution. West Spitzbergen, 61 fath. (G. O. Sars) and 48 fath. (Ohlin); some places on the west coast of Novaya Zemlya, from 3—6 to 5—20 fath. (Stuxberg); in Jugor Schar, 6 fath., and 5—8 fath. (Hansen, Stuxberg), and some places in the Kara Sea, 8 to 11 fath. (Stuxberg). Ohlin says that it occurs in the sea north of Siberia, but I cannot find any positive locality recorded in the literature. It is unknown from Ellesmere Land and the west coast of Baffin Bay and Davis Strait, but has been taken more southwards at Nova Scotia and George Banks, in 16, 18 and 190 fath. (Harger). Finally it has been recorded from a place north of Queen Charlotte Island, British Columbia, 111 fath. (S. I. Smith; Harger).

S. nodulosa, which generally occurs in rather low water, has by Ohlin been considered as circumpolar. It may be so, but it is still extremely uncertain, as the statements above show that our knowledge is still very imperfect.

Family Arcturidæ.

The material comprises three genera: *Arcturus* Latr., *Pleuroprion* zur Strassen, and *Astacilla* Cordiner. In these genera and probably in the whole family the first thoracic segment is immovably coalesced with the head. — The maxillipeds of females with marsupium have their basal part altered and expanded for producing a current of water; the structure of the maxillipeds in the male and the adult female of *Astacilla granulata* G. O. S. has been described above on p. 185.

The number of marsupial plates has been used as generic characters by recent writers, but in most cases the number stated by them is quite wrong. G. O. Sars said in the "Account" p. 88, that *Arcturus* (most probably he had examined *A. Baffini*) has three pairs of marsupial lamellæ "issuing from the 2nd, 3rd and 4th segments", while *Astacilla* has only "a single pair" of lamellæ, on fourth segment. Richardson gives the same numbers in the Monograph. Before quoting further statements on *Astacilla* and closely allied genera it may be said, that in *Arcturus Baffini* I find five pairs of lamellæ belonging to the five anterior pairs of thoracic legs; first pair are considerably smaller than the second, though in reality not small and easily seen when second pair are lifted; fifth pair are even rather large. The genus *Pleuroprion* is closely allied to *Arcturus*; in *P. Murdochi* Ben. I have without difficulty found five pairs, the fifth being somewhat smaller than in *Arcturus*; in *P. hystrix* G. O. S. the same number is found, but *P. frigidum* n. sp. differs in having only four pairs, as it is easily seen that the pair of fifth legs are wanting.

Then *Astacilla*. The first correct statement on the marsupial plates is due to Bonnier, who in 1896 described and figured four pairs in *Astacilla Giardi* Bonn., in 1911 established by Koehler as a new genus, *Arcturopsis*. The last-named author examined *Astacilla longicornis* Sow., *A. granulata* G. O. S., *A. Deshayesii* Luc., *Arcturella danmoniensis* Stebb. and a number of new species belonging to the same genera and to two new genera; he found everywhere three pairs of lamellæ belonging to second to fourth pairs of legs. Stephensen (1915) found four pairs of lamellæ in his *Astacilla*(?) *Bonnieri* Steph., but only three pairs in *A. longicornis* Sow. In *A. longicornis, A. granulata* and in Danish specimens of *Arcturella dilatata* G. O. S. I have found four pairs, and the first pair, belonging to first pair of legs, are somewhat small but always distinct; I am sure that the same number exists in all European species of *Astacilla* and allied genera.

Arcturus Latreille.

The material comprises only a single species, but according to Norman a second form has been found near the Færoes.

134. **Arcturus Baffini** Sabine.

(Pl. XV, fig. 5 a).

1824. *Idothea Baffini* Sabine, Suppl. to the App. to Capt. Parry's Voyage, p. 228; Pl. I, figs. 4—6.

! 1885. *Arcturus Baffini* G. O. Sars, North-Atl. Exp., Crust. I, p. 97; Pl. IX, figs. 1—21.

! — — *tuberosus* G. O. Sars, ibid. p. 102; Pl. IX, fig. 22.

1895. — *Baffini* Ohlin, Bidrag til Känn. om Malakostrakfaunan i Baffin Bay och Smith Sound, p. 15.

Ohlin's book contains much information on variation among specimens. — The largest specimen seen by me is from East Greenland, Lat. 72°53′ N., and is 56·5 mm. long; Norman recorded a specimen to be 60 mm., and Miers a specimen from Grinnell Land, at Lat. 79°29′ N., as being 66 mm.

Occurrence. Taken by the "Ingolf" at seven stations.

Davis Strait: Stat. 31: Lat. 66°35′ N., Long. 55°54′ W., 88 fath., temp. 1·6°; 3 spec.

— — Stat. 34: Lat. 65°17′ N., Long. 54°17′ W., 55 fath.; 2 spec.

West of Iceland: Stat. 87: Lat. 65°02′ N., Long. 23°56′ W., 110 fath.; 2 spec.

Between Iceland and the Færoes: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5°; 14 spec.

— — — — — Stat. 3: Lat. 63°35′ N., Long. 10°24′ W., 272 fath., temp. 0·5°; 14 spec.

— — — — — Stat. 2: Lat. 63°04′ N., Long. 9°22′ W., 262 fath., temp. 5·3°; many specimens; most of them are young.

North of the Færoes: Stat. 143: Lat. 62°58′ N., Long. 7°09′ W., 388 fath., temp. ÷ 0·4°; 2 spec.

Evidently common at Grinnell Land, having been taken there at four places from Lat. 82°27′ N. to Lat. 79°29′ N. in depths not exceeding 30 fath. (Miers). Through Smith Sound from Lat. 78°24′ N. southwards along West Greenland to Lat. 65°17′ N. (= "Ingolf" Stat. 34) it has been taken many times (see Stephensen's Conspectus), the depths north of Cape York being from near 10 to at most 50 fath., but further south from 50—60 to 220—280 fath. — In the area between Iceland and the Færoes, and especially more or less near the last-named islands, the species has been taken many times, most frequently in depths from 40 to 133 fath., but at Vestmanhavn in about 10 fath. (by Dr. Th. Mortensen), and somewhat south-east of the Færoes even in 620 fath., temp. ÷ 0·15° (by Cand. mag. Ad. Jensen); 5 miles east of Seydis Fjord, East Iceland, it was taken in 135 fath. by Admiral Wandel, and more eastward in 299 fath., temp. ÷ 0·3°, by G. O. Sars.

At East Greenland it has been taken by the Ist Amdrup Exp. near Tasiusak, Lat. 65°37′ N., in 15—20 and 20—30 fath.; by the IInd Amdrup Exp. at Henry Land, Lat. 69°34′ N., 20 fath., and in Hurry Inlet, Lat. 70°50′ N., 50 fath.; by the Ryder Exp. in Scoresby Sound, Lat. 70°—71°30′ N., 5—25 fath.; in Lat. 72°26′ N., Long. 19°35′ W., 105 fath., and in Lat. 72°53′ N., Long. 20°36′ W., 96 fath.; by the Danmark Exp. at a number of places from Lat. 76°40′ N. to Lat. 76°45′ N. in from 8—10 to 80—90 fath., and at Lat. 77° N., Long. 18¹/₂° W. on *Antedon prolixa* (Stephensen), finally by the Duke of Orleans in Lat. 77°35¹/₂′ N., Long. 18°12′ W., 28 fath. (Grieg).

Distribution. Between the Færoes and Norway, 412 fath., temp. ÷ 1·0°, and west of Spitsbergen, 416 fath., temp. 0·8° (G. O. Sars). At Ellesmere Land it has been taken near Cape Faraday, 5—10 fath. (Ohlin), and by the IInd Fram Exp. (G. O. Sars); at two places at the west coast of Baffin Bay in 10—28 fath. (Ohlin), finally in Arctic America at Beechey Isl., ab. Long. 91° W. (Sabine).

It may be seen that *A. Baffini* sometimes occurs in less deep places, down to 610 fath., of the cold area, and the lowest temperature recorded is ÷ 1·1°, in Northern Strömfjord. West Greenland (Stephensen); but it has also been found in places with the temperature considerably above zero, thus in 5·3°.

135. **Arcturus scabrosus** Norman.

1904. *Arcturus scabrosus* A. M. Norman, Ann. Mag. Nat. Hist. Ser. 7, Vol. XIV, p. 445.

Occurrence. This species is unknown to me. It is enumerated here because Norman's specimens have been dredged in the cold area south-west of the Færoes in Lat. 60°22′ N., Long. 8°21′ W., 327 to 430 fath.

Pleuroprion zur Strassen.

This genus is closely allied to *Arcturus*, but it is accepted, as its forms differ materially in shape, and the abdomen has only one laterally discernible segment before the large terminal segment. The number of marsupial lamellæ is mentioned above on p. 192. The material comprises three species, one among them new. The following analytical key points out some of the best characters.

A. End of abdomen with a median incision and two acute points. Penultimate joint of the antennal peduncles without processes excepting sometimes from the distal outer angle. Three spiniform processes in the anterior transverse row on the head. Two or three pairs of submedian dorsal processes on first abdominal segment. Marsupium with lamellæ at fifth pair of legs very distinct.

a. Penultimate joint of the antennal peduncles produced at the end into an acute tooth. First abdominal segment with two pairs of submedian dorsal processes, and first pair much smaller than second .... *P. hystrix* G. O. S.

b. Penultimate joint of the antennal peduncles without any tooth at the end. First abdominal segment with three pairs of submedian dorsal processes in two longitudinal rows, and all nearly similar in size .... *P. Murdochi* Ben.

B. End of abdomen triangular, subacute or somewhat obtuse. Penultimate joint of the antennal peduncles with some spiniform processes on the upper surface towards the lateral margin. Four spiniform processes in the anterior transverse row on the head. Only a single pair of submedian dorsal processes on first abdominal segment. No marsupial lamellæ at fifth pair of legs. *P. frigidum* n. sp.

136. **Pleuroprion hystrix** G. O. Sars.

(Pl. XV, figs. 6 a—6 b).

1877. *Arcturus hystrix* G. O. Sars, Arch. Math. og Naturv. Vol. II, p. 350.
! 1885. — — G. O. Sars, North-Atl. Exp. p. 104; Pl. IX, figs. 23—26.

Female. The elaborate description and the figures published by Sars are on the whole good, but several points must be mentioned, especially for procuring characters between this species and the two following forms both unknown to Sars.

The spiniform processes on the body are slender, most of them long, and all long processes are arranged in transverse rows, excepting on the abdomen. The head has two transverse rows, and three such processes in the row behind the front margin; Sars says that only two spines are found in this row, but according to my experience the median spine is always present but varying extremely in length, being from very short to much longer than the sublateral pair. The dorsal surface of each thoracic segment with a transverse row, excepting fourth segment, which has two rows, and so far the segments agree with the figure of Sars, but in adult females the fourth segment has an incomplete or complete additional transverse row of much smaller spines close behind one of the normal rows, or even one behind each normal row, and sometimes also two or three similar spines are found behind the row on third segment. — Sars' figures do not convey a correct picture of the abdomen, as he has drawn the line between the two abdominal segments in a wrong place; especially when the animals are seen from the side, it is easily seen that the first segment has two pairs of dorsal spines, furthermore that the second pair of these spines, which are much larger than first pair (fig. 6 b), in reality are placed on the first and not, as figured and described by Sars, on the second, large segment. This segment has on each lateral margin a long and proportionately broad process, but no smaller spiniform processes, while on its dorsal surface the spiniform processes vary considerably in number, but only a single pair are rather long; the end of abdomen is moderately to very deeply emarginate between the triangular, acute points.

Eyes small (fig. 6 a). — First antennular joint oblong without any dorsal process. Antennæ with the peduncles 5-jointed, but the first joint is short and not visible from above; second joint is very thick, nearly as long as the third, with the outer angle produced into a long or very long process, and on the upper surface a distal very long, spiniform process and a more proximal shorter process. Third joint (fig. 6 a) with only a single process, but this is very long and projects from the outer distal angle. Fourth joint is slender, without spines, except that the distal outer angle is produced into a conspicuous, acute tooth. — The marsupial lamellæ at fifth pair of legs are easily seen.

Length 8—9 mm. — Male unknown.

Remarks. That this species is the real *A. hystrix* G. O. S. is absolutely certain, while the animals figured by Ohlin as *A. hystrix* belong to a new species, *P. frigidum*. — At the front end of the marsupium of one specimen was found a male of the new Epicarid, *Arcturocheres pulchripes*, to be described later on.

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

West of the Færoes: Stat. 44: Lat. 61°42′ N., Long. 9°36′ W., 545 fath., temp. 4·8°; 5 spec.

Furthermore it has been taken by Cand. mag. Ad. Jensen almost south of the Færoes at Lat. 60°10′ N., Long. 6°25′ W., 620 fath., temp. ÷ 0·15, 11 spec., and Norman has recorded it from an adjacent place in the cold area, viz. Lat. 60°21′ N., Long. 5°41′ W., 580 fath.

Distribution. It has been secured somewhat south-west of the last-named place at Lat. 59°54′ N., Long. 7°52′ W., 355 fath. (Norman). Sars has recorded it from three places, viz. one somewhat more distant from the Færoes than from Norway at Lat. 62°44′ N., Long. 1°48′ E., 412 fath., temp. ÷ 1·0°; the second far south-west of Lofoten at Lat. 66°41′ N., Long. 6°59′ E., 350 fath., temp. ÷ 0·9°, and the third west of Lofoten at Lat. 68°21′ N., Long. 10°40′ E., 457 fath., temp. ÷ 0·7°. The other localities recorded in the literature for this species belong to *P. frigidum*.

It is an interesting fact that among the seven stations enumerated one belongs decidedly to the warm area and five to the cold area, but looking at the map of the Norwegian North-Atl. Exp. it is seen that all cold stations are in reality near the limits of the cold area, and vice versa.

137. **Pleuroprion Murdochi** Benedict.

1898. *Arcturus Murdochi* Benedict, Proc. Biol. Soc. Washington, Vol. XII, p. 49, fig. 9.
! 1905. *Pleuroprion* — Richardson, Monograph, p. 342, figs. 371—372.

The single old female seen by me agrees well with Richardson's description in nearly every particular of any significance; Benedict's figure (copied by Richardson) is good excepting as to the proximal part of the abdomen, which does not agree so well with Richardson's ameliorated description.

The species is closely allied to *P. hystrix* but differs in the following particulars. Most of the processes on the body are conspicuously shorter than in *P. hystrix*; an important feature is that my specimen agrees with Richardson's description in having on the dorsal side of first abdominal segment "two longitudinal rows of three spines in each row, one on either side of the median line"; these processes are nearly equal in size, and their number and moderate size is an excellent specific character. In the antennæ the three processes on second joint are short; third joint has in my specimen a terminal, somewhat short process projecting outwards and upwards, while a more proximal spine mentioned by Richardson is wanting; fourth joint agrees completely with the American description and figure, as the joint is thicker than in *P. hystrix*, while the outer terminal tooth found in the last-named species is quite wanting. — The only differences worth mentioning between my specimen and Richardson's description are two, viz. the absence of the spine on third antennal joint somewhat from its end, and the end of abdomen which is only moderately emarginate. But judging from the variation observed in *P. hystrix* these features have no significance as characters.

Length of the single female 9 mm.

Remarks. It may be mentioned that the marsupium contained female and male of the Epicarid *Clypeoniscus Meinerti* Giard & Bonn.

Occurrence. This single female was found in a bottle containing a number of specimens of *Arcturus Baffini* and labelled: Iceland and the Færoes. The contents were at least about fifty years old. It was rather astonishing to find this species, known only from Alaska, in the bottle mentioned, but there is not the slightest doubt that it was taken either at the Færoes or, and perhaps more probably, at Iceland; in earlier years our Museum did not possess a single specimen of any Isopod, or perhaps even of any Crustacean, from Alaska.

Distribution. Hitherto known only from Point Franklin, Alaska, $13^1/_2$ fath. (Benedict).

138. **Pleuroprion frigidum** n. sp.

(Pl. XV, figs. 7 a—7 b).

1901. *Arcturus hystrix* A. Ohlin, Bih. K. Sv. Vet. Akad. Handl. Vol. 26, Pl. IV, No. 12, p. 30; figs. 6 a—6 r. (Not *A. hystrix* G. O. S.).

This species is in general aspect somewhat similar to *A. hystrix*, and has been confounded with it by myself (1895) and by Ohlin, but on a closer examination it shows a number of specific characters. Ohlin has figured both sexes, and his drawings convey a moderately correct idea of their general appearance.

Female. The spiniform processes as in *P. hystrix*, but on several segments of the body somewhat or much more numerous. The head has in its anterior row (fig. 7 a) four processes, the submedian pair of very moderate length, the outer pair small. Each of the three anterior thoracic segments with the normal transverse row. Fourth segment much longer than in the two preceding species, about as long as the head and the three anterior segments combined, and armed with a great number of processes of very different length, but seen from the side the long processes are arranged in four tolerably distinct transverse rows, while a fifth row with somewhat shorter processes is found between first and second row, and many smaller spiniform processes are rather irregularly distributed, especially on the sides. Each of the three posterior thoracic segments with its transverse row and, besides, with several small sublateral or lateral spines. — First abdominal segment (fig. 7 b) with only a single, curved transverse row of six large processes, so that only one pair of submedian processes are found, but these are very long. Last abdominal segment very different from that in either of the two preceding species; each lateral margin (fig. 7 b) has a moderately large process conspicuously smaller than in

P. hystrix and, besides, two or three processes, while the dorsal surface has considerably more processes than in *P. hystrix*; furthermore the lateral margins behind the largest pair of processes are not concave as in the other species but slightly convex, and the abdomen terminates in a subacute or somewhat obtuse end.

The eyes (fig. 7 a) are larger and more protruding than in *P. hystrix*. — First antennular joint is broader in proportion to its length, and has a spiniform process on the upper surface. The antennal peduncles (fig. 7 a) differ much from those in the two other species; the two distal processes on second joint are shorter, while a process directed considerably downwards is found at the inner distal angle; third joint is considerably longer than the second, its outer distal angle produced into a somewhat short process, while on its upper surface two processes are distributed towards the outer margin, and two processes are found on the lower side; fourth joint has the end somewhat thickened, rounded and without spines, but along the upper surface towards the outer margin four or five spines are distributed. — No marsupial lamellæ at the base of fifth pair of legs.

Length of females with marsupium 10 to 14 mm.

Male. Slender; fourth thoracic segment conspicuously longer than the head and the three anterior segments combined. Otherwise it agrees with the female, except in the feature that the number of small spiniform processes not belonging to the normal transverse rows are extremely few.

Length 8·7 mm. — Ohlin has recorded 12 mm., but I suppose this to be a misscript in place of 10 mm., and that in reality he has noted the length of the female as that of the male, and vice versa.

Remarks. The absence of fifth pair of marsupial lamellæ and the considerable length of fourth thoracic segment are, in my opinion, too unimportant features for creating a new genus for this fine species.

Occurrence. Not taken by the "Ingolf". It is only known from the northern part of the east coast of Greenland, where it has been taken at five places.

East Greenland: Estuary of Hurry Inlet: Lat. 70°50' N., 50 fath.; 1 spec. (by the IInd Amdr. Exp.)
— — Lat. 72°26' N., Long. 19°35' W., 105 fath.; 5 spec. (by the Ryder Exp.)
— — Lat. 72°27' N., Long. 19°56' W., ab. 100 fath.; 1 spec. - - — —
— — Lat. 72°53' N., Long. 20°36' W., 96 fath.; 3 spec. - - — —
— — Lat. 74°52' N., Long. 17°16' W., 175 fath.; many spec. (Nathorst Exp., Ohlin).

Astacilla Cordiner.

The number of marsupial lamellæ has been dealt with above on p. 192. According to our present state of knowledge, the animals from our area must be referred to five species. But three of these species, all known from Norway and described by Sars, are still insufficiently known, as they are closely related, and the material hitherto found was insufficient for the study of the variation. At the species in question some remarks on the characters are made later on.

139. **Astacilla longicornis** Sowerby.

1806. *Oniscus longicornis* Sowerby, Brit. Miscellany, T. 19.
! 1897. *Astacilla* — G. O. Sars., Account, II, p. 88; Pl. 36.

The largest specimen, a female with marsupium, is 24·5 mm., while the male is only 12 mm. long.

Occurrence. Not taken by the "Ingolf". But it has been gathered by Cand. mag. Ad. Jensen (in the "Michael Sars") south of the Færoes at Lat. 60°55′ N., Long. 8°56′ W., 69 fath., temp. 9·33°; many spec. — In Sars' work we find Iceland in his list on the distribution of this species; he said the same in the Norw. North-Atl. Exp. Crust. II, p. 31, and Tattersall (1905) has also Iceland, perhaps on the authority of Sars. But Sars himself had not gathered the species at Iceland, and I have been unable to find in the literature any first-hand record on the topic. Our Museum has no specimens from Iceland, and it is not very probable that this large species lives there without having been discovered by any of the Danish zoologists, who have collected Crustacea at a large number of places along the coasts or in the Fjords. Until it has been captured I think it better to suppose that some error has caused Iceland to have been noted by Sars and Tattersall.

Distribution. *A. longicornis* has been taken in about the northern half of the Sound and Store Belt, and in Kattegat and Skager Rak, in from 5 to about 50 fath. (H. J. Hansen). At Norway it "would seem to occur along the whole coast", even to Vadsö, generally in 10 to 30 fath. (G. O. Sars). According to A. M. Norman it is known from Shetland and all the coasts of Great Britain and Ireland, while Zirwas recorded it from some places in the North Sea, 18—180 fath.; west of Ireland it goes down to such considerable depths as 199 and 360 fath. (Tattersall). It is recorded from Guernsey (Norman), but as to its distribution further south nothing seems to be known.

140. **Astacilla (?) arietina** G. O. Sars.

(Pl. XV, figs. 8 a—8 b).

1883. *Astacilla arietina* G. O. Sars, Forh. Vid. Selsk. Christiania for 1882, No. 18, p. 62; Pl. 2, fig. 2.
1897. — — G. O. Sars, Account, II, p. 90; Pl. 37, fig. 1.

The single specimen is a young female, 11 mm. long. It differs from the figures of Sars in the three following particulars. The fourth thoracic segment possesses the two pairs of knots on the anterior dorsal half, but both are distinctly smaller than in Sars' figures, and between them are two pairs of considerably smaller knots; furthermore the dorsal surface behind the second pair mentioned have a number of knots more elevated than figured by Sars. The uropods (fig. 8 a) are conspicuously shorter in proportion to abdomen than figured by Sars, as the distance from their end to the tip of abdomen is nearly half as long as the uropods. Finally the relative length of the joints in the antennal flagellum differs much from Sars' figure, the first joint being only about as long as the sum of the two distal joints (fig. 8 b), while according to Sars the first joint is twice as long as that sum.

The result is that it is a little doubtful whether my specimen belongs to *A. arietina* or to a hitherto unknown species. But as the specimen possesses the projecting pair of protuberances on the head and two pairs of the dorsal tubercles on fourth segment larger than the others, I think the determination might be correct, especially as the specimen is far from adult, and my material of specimens of *A. intermedia* shows considerable variation in the relative length of first joint of the antennal flagellum, and even some variation in the relative length of the distance between the tip of abdomen and the end of the uropods. At all events my remarks and figures may, I hope, render the form easily recognisable to some future Carcinologist who has a richer material at his disposal.

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

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

Distribution. Only three specimens are known, viz. two from Hardanger Fjord, West Norway, 60—100 fath. (G. O. Sars), while the third specimen has been taken midway between Norway and Shetland in 58 or, more probably, 97 fath. (Zirwas).

141. **Astacilla intermedia** Goodsir.

1841. *Leachia intermedia* Goodsir, Edinb. New Philos. Journ. Vol. XXXI, p. 309; Pl. VI, figs. 1—3. (test. Norman).

! 1897. *Astacilla affinis* G. O. Sars, Account, II, p. 90; Pl. 37, fig. 2.

The largest specimen, an ovigerous female, is 14·5 mm. The relative length of the joints in its antennal flagella agrees nearly with Sars' figure, the first joint being at least half as long again as the two other joints combined.

But it may be noted that our Museum possesses 4 specimens of co-types of *A. affinis* presented by Sars; the largest of these specimens, a female with marsupium, measures 16·5 mm., is thus 3·5 mm. longer than the length recorded by Sars, and in this specimen the two distal joints of the antennal flagella combined are not shorter than first joint, thus showing that the character afforded by the relative length of the first joint is somewhat poor.

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

South of Iceland: Lat. 63°15' N., Long. 22°23' W., 114—172 fath.; 6 spec.

Distribution. At Norway in Trondhjem Fjord, 100—200 fath., and off Lofoten, 200—300 fath. (G. O. Sars). A specimen probably belonging to this species was taken in Skager Rak not far from the Skaw, 70 fath. (H. J. Hansen). It has been recorded from Lat. 59°54' N., Long. 0°11' E., 62 fath. (Zirwas); from Fair Island between Orkney and Shetland (T. Scott); from the Firth of Forth; at Durham and off South-West Ireland, 100—200 fath. (Norman), finally from four places west of Ireland, in from 120 to 199 fath. (Tattersall).

142. **Astacilla pusilla** G. O. Sars.

1873. *Arcturus pusillus* G. O. Sars, Forh. Vid. Selsk. Christiania for 1872, p. 73.

! 1897. *Astacilla pusilla* G. O. Sars, Account, II, p. 91; Pl. 37, fig. 3.

Sars has noted that the adult female scarcely exceeds 8 mm. in length; my two females with marsupium are respectively 10·8 mm. and about 12 mm. long, but belong unquestionably to this species.

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

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 2 spec.

Distribution. Hitherto only known from three places at West Norway: off Sognefjord, 209 fath. (G. O. Sars, 1886); Storeggen bank, and off Lofoten, 80—100 fath. (G. O. Sars, 1897).

143. **Astacilla granulata** G. O. Sars.

(Pl. XV, figs. 9 a—9 b).

1877. *Leachia granulata* G. O. Sars, Arch. for Math. og Naturv. Vol. II, p. 351.

1880. *Astacilla* — Harger, Rep. U. S. Comm. Fish and Fisheries, Pt. VI, p. 364; Pl. VIII—IX, figs. 48—52.

! 1885. *Astacilla granulata* G. O. Sars, North-Atl. Exp. p. 107; Pl. IX, figs. 27—35.

The text on the maxillipeds of male and female shown in figs. 9 a and 9 b is found above on p. 185.

In the marsupium of two females from the "Ingolf" Stat. 4 I found two new genera of Cryptoniscidæ (see later on).

Occurrence. Taken by the "Ingolf" at three stations.

Between Iceland and the Færoes: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5°; 12 spec.

— — - - — Stat. 2: Lat. 63°04′ N., Long. 9°22′ W., 262 fath., temp. 5·3°; 2 spec.

West of the Færoes: Stat. 44: Lat. 61°42′ N., Long. 9°36′ W., 545 fath., temp. 4·8°; 2 spec.

Furthermore it has been gathered four times in Baffin Bay off West Greenland between Lat. 72°41′ N., Long. 59°50′ W. and Lat. 69°16′ N., Long. 58°8′ W., in depths from 183 to 227 fath. (H. J. Hansen). Also gathered somewhat south-west and south-east of the Færoes in Lat. 60°31′ N., Long. 9°18′ W., 229 fath., and Lat. 60°21′ N., Long. 5°41′ W., 580 fath. (Norman); by Cand. mag. Ad. Jensen (in the "Michael Sars") at Lat. 60°10′ N., Long. 6°25′ W., 620 fath., temp. ÷ 0·15°, many spec., and at Lat. 60°10′ N., Long. 6°35′ W., 650 fath., temp. ÷ 0·53°, 1 spec. Finally east of Iceland: Lat. 64°36′ N., Long. 10°22′ W., 299 fath., temp. ÷ 0·3° (G. O. Sars, 1885).

Distribution. Taken at four places off Norway far from the coast, between Lat. 62°44′ N., and Lat. 71°25′ N., in depths from 350 to 620 fath., temp. from ÷ 0·7° to ÷ 1·0° (G. O. Sars). Finally taken off New England, Nova Scotia and New Foundland, in 250 fath. and, which must have been by curious chance, in 7 fath. (Harger).

Discarding the statement as to 7 fath. it is seen that *A. granulata* has been taken in depths from 183 to 650 fath., and both in the cold and the warm areas. But looking at the map of the Norw. North.-Atl. Exp. it is seen that all five stations recorded for that expedition (18, 48, 124, 164, 200) were in the cold area, but not far from the limit between this and places with a temperature above zero, and the stations from the "Ingolf" and those south-west or south-east of the Færoes are not very far from the same limit.

Sub-Order *Oniscoidea.*

With the exception of a single genus the animals from Northern Europe and Greenland belonging to this sub-order are all exclusively terrestrial, and therefore omitted here. It may only be said that two species, *Porcellio scaber* Latr. and *Oniscus murarius* Cuv., have been taken by the "Ingolf" at Trangisvaag, Suderõ (one of the Færoes), but according to Budde-Lund (1885) both these forms, which have an extremely wide distribution, were known from West Greenland (O. Fabricius) and Iceland. The single genus to be mentioned here is *Ligia* J. C. Fabr. (this well-known name is preferred and the name *Ligyda* Rafinesque, proposed by Richardson, discarded).

Ligia J. C. Fabricius.

In his "Remarks" on the Oniscoida G. O. Sars (Account, p. 153) wrote that the antennæ have "a 5-articulated peduncle", and this is probably generally accepted. But in *Ligia oceanica* I found not only six joints in the peduncle, but even an exopod or squama on third joint. When the head is inspected from above and somewhat from in front, and the antenna is bent downwards and turned in various directions, we find (fig. 10 a) a transverse, movable piece of hard chitine (*1*) between the head and the major outer part of next joint (*2*); that transverse piece is the easily seen rudiment of first joint, and the remainder of the peduncle contains five joints. Furthermore a squama (*ex*) is observed on the outer side of third joint; this squama is somewhat broader than long, with its distal half subtriangular and freely protruding, while the proximal half has a semicircular outline and is anchylosed to the joint; it may be added that this suture between exopod and joint is very distinct, but in a very large specimen its median part is obscure. I think the existence of six peduncular joints and squama very interesting, because it shows that two such primitive features have been preserved in a genus which in other organs, such as the reduced antennulæ, the pleopods, and the basal joint of the thoracic legs united as immovable, large epimeral plates with the segments, is very far from exhibiting primary structural features.

144. Ligia oceanica Linné.
(Pl. XV, fig. 10 a).

1767. *Oniscus oceanicus* Linné, Syst. Nat. Ed. XII, P. II, p. 1061.
1885. *Ligia oceanica* Budde-Lund, Crust. Isop. Terr. p. 259.
! 1898. — — G. O. Sars, Account, II, p. 156; Pl. 70.

On the antennæ see above. — My largest specimen, a male from Thorshavn, is larger than any hitherto recorded, being 30 mm. long (without uropods) and 16·5 mm. broad.

Occurrence. Taken by the "Ingolf" at Trangisvaag in Suderö, one of the Færoes, in 30—40 feet above the level of the sea, together with *Orchestia*.

It has furthermore been taken at Thorshavn, Strömö, at the beach by Mag. R. Hörring, and at least three times before at the Færoes by various collectors. Besides, it has been discovered by Cand. mag. Sæmundsen at the Vestmann Islands, not very far from the south coast of Iceland.

Distribution. This species has been found on wet rocks near the surface of the sea on Bornholm in the Baltic (H. J. Hansen), and at a number of places on the coasts of Denmark, at the oceanic coasts of Norway northwards at least to Trondhjem (G. O. Sars), at Great Britain and Ireland, at the south coast of the North Sea and at the Channel, at the Atlantic coast of France, Spain and Portugal, at Gibraltar and Malaga, but is according to Roux unknown from the other coasts of the

Mediterranean (Budde-Lund and other authors); Risso's statement (test. Carus) on its occurrence at Nizza ought therefore to be considered as somewhat doubtful. Finally taken at Newport, Rhode Island, U. S. (Richardson).

Sub-Order *Epicaridea*.

In the paper on the Isopoda, etc., from the German Plankton-Exped. (Ergebn. der Plankton-Exp. Vol. II, G, c, 1895) I pointed out the importance of the structure of the types of the second larval stage for the classification of the families (or sub-families, as I named them) of this division of parasitic Isopoda. In 1887 Giard & Bonnier had divided the Epicaridea into seven families, one among them being the Microniscidæ. The genus *Microniscus* I discarded as too imperfectly known and treated it with caution; of the other families I suppressed two, reducing three families to a single family, the Cryptoniscidæ, especially because in all three "families" the second larval stage shows rather close relationship and differs much from those of the remaining three families. Finally I decribed and figured twenty species of larvæ in second stage of all four "subfamilies", pointing out a good number of characters.

In 1898 G. O. Sars showed that the genus *Microniscus*, consequently the family Microniscidæ Giard & Bonnier, must be cancelled, as the animals in question are "a transitory larval stage of Epicarida belonging to different families" (Account, II, p. 218); furthermore he adopted my division of the Epicaridea into four families, yet without mentioning my paper; the only addition worth mentioning he made as to this topic was to cancel the family Podasconidæ established by Giard & Bonnier a few months after my above-named paper had been published.

In the voluminous and valuable book: Contributions à L'Étude des Épicarides, 1900, J. Bonnier attempted a new classification. He divided the Epicaridea into two groups: Cryptoniscinæ and Bopyrinæ, which may be acceptable chiefly for the reason, that in the Cryptoniscinæ the male preserves completely the external structure of body and appendages found in the second larval stage, while in the Bopyrinæ the male is quite different from that larval stage. But as strong differences are found between the second larval stages of the Bopyridæ and the Dajidæ, and as the females of the Entoniscidæ differ extremely from those of the Bopyridæ or the Dajidæ, it may be only a matter of opinion whether the three families Bopyridæ, Dajidæ and Entoniscidæ are united as a group opposed to the Cryptoniscidæ, or all four families are arranged as equivalent. Furthermore Bonnier divided his Cryptoniscinæ into eight families, among which the unfortunate Microniscidæ, but this classification is extremely premature, being based mainly on the idea that parasites found on two different orders of Crustacea cannot belong to the same family; this classification must be totally discarded. Finally he divided the Bopyrinæ into four families: Dajidæ, Phryxidæ, Bopyridæ, and Entoniscidæ; to the Phryxidæ he referred forms living on the abdomen of the Decapoda, and to the Bopyridæ those inhabiting the branchial cavity, but this classification, which he characterized as provisional, has no value, and the two families named must be united.

The material from our area is not large, comprising only thirteen species, belonging to three of the four families designated by me as subfamilies in 1895, as only the Entoniscidæ have no representative. But as to three points the material is of real importance. The first point is that I have found a species of the Cryptoniscidæ in the marsupium of two genera of Cumacea, and no Epicarid was previously known from any form of this order. The second point is not less interesting. It is a well-known fact that in the second larval stage of the Dajidæ the mouth terminates in a circular, somewhat funnel-shaped sucking-disk, while such a disk was not known in any larva of the three other families. Now I have found that the mouth of the second larval stage of *Bopyroides hippolytes* Kr. terminates in a somewhat similar disk, thus in this respect bearing much similarity to those in the larval Dajidæ, while in all other features, as antennulæ, antennæ, posterior legs, uropods, the larva of *Bopyroides* agrees with the larvæ of the Bopyridæ and differs widely from those of the Dajidæ — but consequently the analytical key to the larvæ of second stage of all Epicaridea in my Plankton-paper ought to be altered as to this character. The third point of interest is, that in the marsupium of two specimens of the same species of *Astacilla* from the same station I found two genera of Cryptoniscidæ, both new. — Finally it may be emphasized that the second larval stage affords excellent specific characters, especially in the antennulæ, which therefore must be examined more in detail than generally is the case.

Family Bopyridæ.

Only three genera are known from our area, each with a single species.

145. **Bopyroides hippolytes** Kröyer.

(Pl. XV, figs. 11 a—11 d).

1838. *Bopyrus Hippolytes* Kröyer, Grönl. Amfip., in Kgl. D. Vid. Selsk. natur. math. Afd. p. 306; Pl. IV, fig. 22.

(?) 1846. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. 28. figs. 2 a—2 p.

! 1897. *Bopyroides hippolytes* G. O. Sars, Account, II, p. 199; Pl. 84, fig. 2.

1900. — *Sarsi* Bonnier, Contrib. à L'Étude des Épic., p. 376; Pl. XLI.

1905. — *hippolytes* Richardson, Monograph, p. 567, figs. 628—637 (with synonymy and distribution).

To Sars' representation of both sexes I have nothing to add, and follow him in considering the parasites of the three species of *Spirontocaris*, viz. *S. polaris* Sab., *S. spinus* Sow., and *S. Lilljeborgii* Dan., as belonging to the same species.

Second larval Stage. I have examined a larva inhabiting a feeble swelling of the carapace of *S. polaris*, which certainly would have developed into a female and is 1·2 mm. long, and a larva placed on a very young female infesting a young *S. spinus*, and this larva is certainly of the male sex and 0·92 mm. long.

The body is somewhat more than three times as long as broad, and on the upper surface set with extremely fine, short hairs. — The front margin of the head is broadly convex. Eyes black, each with about 9 ocelli. — Antennulæ very thick and characteristic; in the large specimen (fig. 11 a) they are nearly horizontal with the third joint bearing the two rami turned somewhat backwards along the terminal margin of second joint, while in the small specimen the antennulæ (fig. 11 b, in which the major part of first joint is omitted) are directed outwards and somewhat downwards, and their third joint outwards and somewhat forwards, so that it is easily discernible from the second joint. The figures show a very characteristic armature with regularly arranged, triangular processes on the distal, posterior part of first joint, while second joint has low tubercles or blunt processes on the lower surface and two somewhat short, acute processes and one rather long, acute process at the hind margin; third joint without processes, its first ramus short, and each of both rami with three long terminal setæ, while six sensory setæ originate partly from the long ramus and partly from the joint (the number and length of these setæ could not be made out in the large specimen). — The antennæ reach slightly beyond the hind margin of third thoracic segment, and are built as in other larvæ of the Bopyridæ, with four joints in the peduncle and four in the flagellum; third peduncular joint with the lower terminal margin divided by narrow incisions into some teeth. — The broadly conical proboscis terminates in a moderately small, subcircular, funnel-shaped sucking-disk, which seems to be more thin-skinned than in the Dajidæ, and has the lower surface glabrous; the end of the mandibles as usual seen in the central hole.

Thoracic epimera triangularly produced backwards, without serration. All seven pairs of thoracic legs subsimilar, with the hand ovate. — Pleopods (fig. 11 c) with both rami well developed; the outer ramus longer and much narrower than the inner. Sixth abdominal segment seen from above (fig. 11 d) triangular; the portion along the whole posterior margin produced into a thin plate which is broadest at the median line, and the median half is divided by narrow incisions into four pairs of comb-teeth and rudiments of a fifth pair; the median pair of teeth are a little stronger than the others; below and behind this pair a very long, acute process projects backwards, but its major part is covered by the segment. — Uropods nearly as in *Phryxus*, with the endopod about half as long as, and much narrower than, the exopod.

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°; on 1 spec. of *Spir. polaris*.

North of Iceland: Stat. 127: Lat. 66°33′ N., Long. 20°05′ W., 44 fath., temp. 5·6°; on 2 spec. of *S. spinus*.

It has been collected at numerous places at both sides of Greenland in depths from a few down to 175 fath. According to my Malac. Groenl., Stephensen's Conspectus, and a good number of specimens not recorded but secured by various collectors since 1887, it has west of Greenland been taken so far north as in Lat. 81°44′ N. at Grinnell Land, and at Port Foulke, Lat. 78°17′ N., and off the west coast of Greenland at about fifteen places between Lat. 73° and Lat. 60°43′ N.; it was always found on *Spirontocaris polaris* and *S. spinus*, but from Kröyer's time our Museum possesses a couple of females taken, according to the label, at Julianehaab on *S. Fabricii*; when Stephensen stated it to have been taken by the "Tjalfe" on *S. macilenta*, the name of the host is a misscript for *S. spinus*. New localities — not found in Stephensen's Conspectus — are: Egedesminde, Akugdlek, Fiskenæs and

Bredefjord. In most cases either the right or the left branchial cavity of the host contained the parasite, but in some few cases both branchial cavities were infested. — At East Greenland it has been found only on *S. polaris* and was taken by Mag. Kruuse at Angmagsalik, Lat. 65°30′ N.; by the Ryder Exp. in Hekla Havn, Lat. 70°27′ N.; by the IInd Amdrup Exp. at Sabine Island, Lat. 74°30′ N.; by the Danmark Exp. at several places between Lat. 76°40′ N. and Lat. 76°50′ N. (Stephensen), finally by the Duke of Orleans at Lat. 77°31′ N., Long. 18°24′ W., 146 fath. (Grieg).

At East Iceland it has been taken by the "Thor" in Rode Fjord, 88 fath., on *S. spinus*; near the Færoes by Dr. Th. Mortensen off Akraleite, ab. 150 fath., on *S. Lilljeborgii*.

Distribution. This species is known from Skager Rak on *S. Lilljeborgii* (H. J. Hansen), from the whole coast of Norway from Christiania Fjord to Vadsø, taken on *S. polaris*, *S. spinus* and *S. Lilljeborgii* (G. O. Sars), and from the Barents Sea (Hoek, Weber), but not from the Kara Sea. At Britain recorded from the Clyde (T. Scott), and from the south coast of Cornwall (Bate & Westwood). Off the northern and the southern half of Baffin Island it has been taken several times on *S. polaris* (Ohlin). Furthermore H. Richardson recorded it from Nova Scotia and several places at the east coast of the U. S. A. north of Cape Cod, occurring not only on *S. polaris*, *S. spinus* and *S. Lilljeborgii*, but on *S. Fabricii* Kr. and *S. pusiola* Kr. I think that all these statements are correct, but H. Richardson besides recorded it from many places in the North-East Pacific, viz. from Puget Sound, ab. Lat. 47½° N., northwards to Alaska and the Bering Sea; it is stated to have been found on *Spirontocaris spinus*, on five other exclusively Pacific species of the same genus, on *Pandalus Montagui* Leach., *P. borealis* Kr. and the exclusively Pacific species *P. Jordani* Rathb., finally on *Pandalopsis dispar* Rathb. Later (1909) that authoress added two stations from the west part of the Bering Sea and a place in the Sea of Japan at Lat. 38°09′ N. But several of these statements seem to me to be somewhat less certain, and a critical re-investigation of the parasites would be desirable, especially if the second larval stage could be found on *Pandalus* and *Pandalopsis*. It would, for instance, be interesting if *B. hippolytes* occurs on specimens of *Pandalus Montagui* and *P. borealis* in the North Pacific, but not on the same forms in the North Atlantic.

146. **Pseudione Hyndmanni** Bate & Westw.

(Pl. XV, figs. 12 a—12 c).

1868. *Phryxus Hyndmanni* Bate & Westwood, Brit. Sessile-eyed Crust., Vol. II, p. 243.
! 1898. *Pseudione* — G. O. Sars, Account, II, p. 202; Pl. 85, fig. 2.
1900. — — Bonnier, Contrib. à l'Étude des Épicarides, p. 295, Pl. XVIII.

Sars' figures and descriptions of both sexes are sufficient, but he did not know the second larval stage.

A male larva (fig. 12 a) is 0·84 mm. long, somewhat less than four times as long as broad, with exceedingly short and fine hairs on the upper surface. The front margin of the head is strongly convex; the eyes feebly developed, brownish, and I was unable to discover real ocelli on the surface. — The antennulæ (fig. 12 b) are extremely broad; first joint (*l*) with the front half of the outer margin peculiarly curved, and the anterior part of second joint is produced inwards along the feebly concave antero-lateral margin almost to the median line; both these joints without processes. Third joint very broad, and its posterior margin produced into three somewhat small, acute teeth; the rami normal. — The antennæ nearly reach the middle of fourth thoracic segment. — Proboscis not very thick and constitutes, seen from the side, a protruding cone a little longer than deep and without terminal disk. — Thoracic epimera without serration; the legs subsimilar with the hand ovate. Pleopods nearly as in *Bopyroides*. — Last abdominal segment (fig. 12 c) posteriorly produced and divided by deep incisions into two pairs of long, somewhat narrow comb-teeth, while the part between the outer deep incision and the lateral margin is a broad triangle. — Uropods somewhat long; the relative length and thickness of the rami nearly as in *Bopyroides*.

Remarks. Bonnier (l. c.) attempted to show that *Pseudione Hyndmanni* as described and figured by Sars is a species different from that found in the Channel and at England and established by Bate, though the host in both cases was *Eup. bernhardus*, and Bonnier applied the name *P. proxima* to the form figured by Sars, without having seen any specimen. The specimen mentioned by Sars as found on *E. pubescens* was considered by Bonnier as being very probably a third species, *P. dubia*, nomen nudum. This opinion was due to the unfortunate theory of Giard & Bonnier, that the same species of parasite cannot infest two species of hosts.

Occurrence. A small specimen of *Eupagurus pubescens* Kr. with this parasite was taken by the "Ingolf".

North of Iceland: Stat. 129: Lat. 66°35′ N., Long. 23°47′ W., 117 fath., temp. 6·5°; 1 spec.

Furthermore two specimens of *Eup. pubescens* with this *Pseudione* were captured by the "Thor" at the following places.

South of Iceland: Lat. 65°18′ N., Long. 21°30′ W., 94 fath.; 1 spec.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 1 spec.

Distribution. Taken in the most northern part in the Sound and rather common in Kattegat on *Eupagurus bernhardus*, most frequently in depths from 6 to 10½ fath., but going down to 56 fath. (H. J. Hansen). Rare at Norway, on *E. bernhardus* and *E. pubescens* (G. O. Sars); besides in the North Sea off Esbjerg (H. J. Hansen), at Ireland (Bate and Tattersall), and in the Firth of Clyde (T. Scott), but in the last-named place taken in the branchial cavity of *Hippolyte varians*, which makes the determination of the parasite a little doubtful. That the parasite mentioned by Bate ("Challenger" Macrura p. 645) as "resembling *Phryxus hindmanni*" and taken on a shrimp probably belonging to *Plesionika semilævis* Bate from the Philippine Islands cannot be our northern species is, of course, quite certain.

147. **Phryxus abdominalis** Kröyer.

(Pl. XV, fig. 13 a).

1840.	*Bopyrus*	*abdominalis*	Kröyer, Naturh. Tidsskr. Vol. III, p. 102—112, 289—299; Pls. I—II.
? 1846.	—	—	Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. 29, figs. 1 a—1 u.
! 1898.	*Phryxus*	—	G. O. Sars, Account, II, p. 215; Pls. 90—91.
1905.	—	—	Richardson, Monograph, p. 500; figs. 550—552.

The representation of Sars is rich and excellent. Sars has also figured the male larva of second stage and its head from below, but a few points on the antennulæ may be added. — The antennulæ (fig. 13 a) are moderately thick; first joint has the anterior margin only somewhat shorter than the posterior, and some three triangular teeth are found at the last-named margin; second joint is a little longer than the first, with two small and slender teeth on the posterior margin and a few teeth of different size on the posterior part of the lower surface; third joint with five or six sensory setæ. — Length of the specimen examined 0·81 mm.

Occurrence. Taken by the "Ingolf" at five stations.

Davis Strait: Stat. 33: Lat. 67°57' N., Long. 55°30' W., 35 fath., temp. 0·8°; on 6 spec. of *Spirontocaris spinus* and on 1 spec. of *Pandalus Montagui*.

— — Stat. 29: Lat. 65°34' N., Long. 54°31' W., 68 fath., temp. 0·2°; on 1 spec. of *Spir. spinus*.

— — Stat. 34: Lat. 65°17' N., Long. 55°17' W., 55 fath.; on 2 spec. of *Spir. spinus* and 1 spec. on *Spir. polaris*.

North of Iceland: Stat. 127: Lat. 66°33' N., Long. 20°05' W., 44 fath., temp. 5·6°; 1 spec. on *Pandalus Montagui*.

— - — Stat. 126: Lat. 67°19' N., Long. 15°52' W., 293 fath., temp. ÷ 0·5°; 1 spec. on *Pandalus borealis*.

This species is even more common than *Bopyroides hippolytes* at both sides of Greenland. According to my Malac. Groenl., Stephensen's Conspectus, and a number of specimens taken since 1887 and hitherto not recorded, it has been taken at three places in Grinnell Land, the most northern being in Lat. 81°44' N.; in Lat. 77½° N., and Lat. 76°09' N. at West Greenland (Ohlin); in Baffin Bay and Davis Strait off or at West Greenland at about sixteen places between Lat. 72°47' N., and Lat. 61½° N., and five new localities may be enumerated, viz. Umanak, Jacobshavn, Egedesminde, Kvanefjord, and Bredefjord. In that area it has been taken on *Spirontocaris spinus*, *S. polaris*, *S. turgida*, *S. macilenta*, *S. Gaimardii*, *Pandalus borealis* and *P. Montagui*. — At East Greenland it is common. At Angmagsalik, Lat. 65°30' N., it was taken by Mag. Kruuse on *S. polaris*, and by the IInd Amdrup Exp. on *S. Gaimardii*, 9—0 fath.; in Lat. 69°40' N., Long. 23°30' W., 120 fath., on *S. polaris* by the IInd Amdrup Exp.; in Hekla Havn, Lat. 70°27' N., on *S. turgida* by the Ryder Exp.; by the Danmark Exp. at several places between Lat. 76°40' N. and Lat. 76°50' on *S. polaris*, *S. turgida* and *S. Gaimardii* (Stephensen); finally by the Duke of Orleans at Lat. 77°31' N., Long. 18°24' W., 146 fath. (Grieg). — At Jan Mayen it was taken by the IInd Amdrup Exp. on *S. Gaimardii*, 55 fath., and had been recorded from that place by Koelbel.

At Iceland this parasite is not uncommon, having been taken by various collectors in depths from 2—4 to about 50 fath., generally on *S. Gaimardii*, but a single specimen on *S. polaris*; at the west coast it was found in Skutils Fjord, Onundar Fjord, Dyre Fjord and near Reykjavik; on the east coast in Mid Fjord, Seydis Fjord and Rode Fjord. Cand. mag. Ad. Jensen has taken it on *Pandalus Montagui* east of Iceland at Lat. 64°17' N., Long. 14°44' W., 45 fath. — It is not known from the Færoes.

Distribution. At Denmark taken in the Belts, in Kattegat and in Skager Rak — in the last-named area in from 70 to 275 fath. — on four of the five above-named species of shrimps (H. J. Hansen), but when Meinert recorded it as taken at Hellebæk, northern part of the Sound, on *Crangon Allmani*, I suppose now that this statement is due to some misscript or error. According to Sars it is known from the whole coast of Norway from Christiania Fjord to Vadsø, living on *Spir. Gaimardii*, *S. polaris*, *S. pusiola*, *S. turgida*, *S. spinus*, *S. Lilljeborgii*, *Pandalus borealis*, *P. Montagui* and *P. propinquus*. It has been found on *S. Gaimardii* at Spitzbergen (G. O. Sars); north-east of Spitzbergen in Lat. 80°15′ N., Long. 33°10′ E. (Ohlin); in the Barents Sea (Max Weber); at the west coast of Novaya Zemlya — here also on *S. turgida* — and in the straits to the Kara Sea (Stuxberg, Stappers); finally in the Kara Sea (H. J. Hansen). Furthermore known from places in the North Sea and from Sussex in the eastern part of the Channel (various authors), but not from its major western area. When Stephensen quoted from Zirwas, that Carus had recorded it from the Mediterranean, I consider the determination of the parasite as wrong; Carus said: "Adria: Trieste, in Virbio viridi et Hippolyta, rara (Walz)".

Off the Baffin Island it was taken on *S. polaris* and *S. turgida* at two distant places, the most northern in Lat. 73°48′ N. (Ohlin). Richardson (1905) enumerated a number of localities in the Atlantic at the coast of the U. S. A. from about Lat. $41^1/_3$° N. northwards, and at Nova Scotia; the hosts were six of the above-named European shrimps and, besides, *Pandalus leptocerus*. In the same work the authoress has also a long list of localities from the North Pacific and both sides of the Bering Sea, the most southern place being Point Arena, California, ab. Lat. 39° N.; the hosts were *Spiront. Gaimardii*, *S. polaris, S. Fabricii, S. groenlandica* and besides seven species of *Spirontocaris* known only from the Pacific; in 1909 Richardson enumerated a number of stations from the North-West Pacific, in the Sea of Japan from ab. Lat. 36° N. northwards to near Lat. 53° N. in the Bering Sea, but I entertain some doubt as to the occurrence of this species of *Phryxus* at all these places, especially those in the Sea of Japan and off California. And when the authoress quotes Bate ("Challenger" Macrura, p. 645—646) as having recorded this parasite from the Philippine Islands on *Plesionika semilævis* Bate she is quite wrong, as Bate wrote that the parasite in question "closely approximates to *Phryxus abdominalis* Kr., but differs in having ...", which shows that he did not refer the parasite to the Kröyerian species.

Family Dajidæ.

Three genera, with five species, are known from our area.

Dajus Kröyer.

The material contained two species, one of which is new.

148. Dajus mysidis Kröyer.

(Pl. XV, figs. 14 a—14 b).

? 1846. *Dajus Mysidis* Kröyer, in Gaimard, Voy. in Scand., Crust. Pl. 28, fig. 1, A—B.

1874. *Leptophryxus mysidis* Buchholz, Zweite Deuts. Nordpolarfarht, Vol. II, Crust. p. 228; Pl. II, fig. 2.

! 1889. *Dajus mysidis* Giard & Bonnier, Bull. Sci. France et Belgique, Vol. XX, p. 255—266, p. 272; Pls. VI—VII.

! 1898. — — G. O. Sars, Account, II, p. 223; Pls. 93—94.

This interesting parasite has been extremely well worked out by the French authors and by G. O. Sars. I am only able to add a little on the second larval stage, as the figures in question drawn by Sars are somewhat too small.

The antennulæ of that larval stage are extremely characteristic (fig. 14 a). The first joint of the left antennula touches that of the right at the median line in front of the mouth; the anterior margin of the joint is moderately long, but shorter than that of the second; posteriorly the joint is produced into a long, narrow, acute process, and the outer margin is distinctly concave without armature. Second joint is large, subtriangular, and its long distal margin has three oblong, acute processes, the anterior smaller than the others, and at its base on the lower surface of the joint is found a tooth. Of the two rami one is somewhat long, the other very short and distally widened. — The sucking-disk is somewhat large, seen from below deeply funnel-shaped, with an area along the whole margin finely sculptured. — The hand of seventh pair of thoracic legs (fig. 14 b) robust, only twice as long as deep; the two lappets at the prehensile margin are well developed, and each with six branches. — Length 1·1 mm.

Sars has figured what he believed to be first larval stage of this species, and his specimens were taken in Plankton samples. Perhaps his interpretation is right, but I am not quite sure, as his figure shows the hands of the thoracic legs very long and slender and, what is of special importance, with the thin "claw" very short. But from a marsupium I have a number of young which certainly are still a little more juvenile, as each leg is still enclosed within the embryonic membrane, but through this membrane the hands are seen to be somewhat thicker with the new "claw" very long, and it seems somewhat improbable that the "claw" is later much reduced in length.

Remarks. It is well known that the female with its male is found in the marsupium of *Mysis oculata* or *M. mixta*. But among the large material from Hurry Inlet I found a young female beneath the posterior lateral part of the carapace; the marsupium of the host is rudimentary, and the parasite is scarcely more developed than the youngest female figured by Sars on Pl. 94. In four specimens of *Mysis* with a full-grown female in the marsupium I found a larva in second stage fixed on one of the pleopods of second or third pair.

Occurrence. Not found by the "Ingolf".

The parasite has been taken on *M. oculata* from a number of stations along West Greenland, viz. Murchison Sound, ab. Lat. 77°30′ N., 25 fath. (Ohlin); Duck Island, Lat. 73°55′ N., 3—15 fath. (Ohlin); Kingigtok, Lat. 73°17′ N. (Ohlin); Jacobshavn, Lat. 69°13′ N. (Mag. Traustedt leg.); Claushavn, Lat. 69°05′ N., 5—10 and 10—15 fath. (H. J. Hansen); Egedesminde, Lat. 68°42′ N., 20—25 fath. (Bergendal leg.); Holsteensborg, Lat. 66°56′ N. (Traustedt leg.), and Brede Fjord, ab. Lat. 61$^1/_3$° N. (Stephensen leg.) — At East Greenland it is more common. At Angmagsalik, Lat. 65°30′ N., it was taken on *Mysis oculata* in 10—15 fath. by the Ist Amdrup Exp., and in 10—0 fath. by the IInd Amdrup Exp.; in Hurry Inlet, Lat. 70°50′ N., the IInd Amdrup Exp. secured a large number of *M. oculata* and some specimens of *M. mixta* with the parasite in 7—0 fath.; furthermore at Sabine Island; Lat. 74°30′ N. (Buchholz), and in Danmark Havn, Lat. 76°45′ N., on *M. oculata* in from 0—5 to 10 fath. (Stephensen). — Sars stated it to be common on *M. oculata* at Jan Mayen, but it is not known from Iceland.

Distribution. It has been taken at Norway on *M. mixta* at Lat. 66° N. and on *M. oculata* at Vardø and Vadsø, Finmark (G. O. Sars). It is common at Spitzbergen on *M. oculata* (G. O. Sars, Hoek), is known from Kostin Schar, south-west coast of Novaya Zemlya (Stuxberg, H. J. Hansen) and from Franz-Joseph Land (T. Scott), at both places on *M. oculata*. North of the New Siberian Islands larvæ in both stages referred to this form were taken in Plankton samples (G. O. Sars). Finally taken at five places off the east coast of Baffin Land, between Lat. 73°48′ N. and Lat. 64°56′ N., on *M. oculata* (Ohlin), and at Labrador (Packard).

149. **Dajus profundus** n. sp.

(Pl. XV, figs. 15 a—15 e).

Female. Intermediate between *D. mysidis* Kr. and *D. siriellæ* G. O. S. — The body (figs. 15 a—15 b) somewhat oblong-cordiform in outline; the area comprising head and thoracic legs is somewhat remote from the emarginate front margin of the body. Seen from above (fig. 15 a) the abdomen, which is almost one-third as long as the remainder of the body, is proportionately narrow and comprises four distinct segments; the last segment is a little longer than broad, and terminates in a pair of very narrow, nearly linear uropods, which are as long as the segment. Length (in the median line) 1·47 mm.

Male. Not fully three and a half times as long as broad (fig. 15 c). Head fused with the first thoracic segment; both combined as long as the sum of the two following segments and somewhat quadri-lateral. Front margin of the head long, transverse; the antero-lateral angles broadly rounded; the lateral margins somewhat diverging backwards. — Antennulæ (fig. 15 d) rudimentary. Antennæ rather long, reaching the posterior margin of third thoracic segment, 9-jointed; the second, the fifth and the three distal joints longer than the others. Proboscis broad at the base. — The hand of the thoracic legs very thick (fig. 15 e). — Abdomen as long as the sum of the three posterior thoracic segments and half of the fourth, somewhat less than twice as long as broad, tapering considerably posteriorly, and the end is truncate, with scarcely any vestige of uropods. — Length 0·42 mm.

Remarks. The female differs from *D. mysidis* especially in having the abdomen much more slender and terminating in long and very slender uropods. The male differs in the shape of head and abdomen and in the length of the antennæ.

Occurrence. Not taken by the "Ingolf", but found in the marsupium of a specimen of *Paramblyops rostrata* Holt & Tatt. captured by the "Thor" at the following place.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath., young-fish trawl with 1700 m. wire out; 1 spec.

Holophryxus Richardson.

In later years two species have been found in our area.

150. **Holophryxus Richardi** Koehler.

! 1911. *Holophryxus Richardi* Koehler, Bull, l'Inst. Océan. Monaco, No. 196, p. 23, figs. 15—17.
! 1912. — — Stephensen, Vid. Medd. Naturh. Foren. Kjøbenhavn, Vol. 64, p. 108, figs. 9—10.

! 1912. *Holophryxus* sp. (*Richardi?*) Stephensen, l. c. p. 109, figs. 11—12 and 14 and lower half of fig. 13.
1915. — *Richardi* Stephensen, Rep. Dan. Ocean. Exp. 1908—1910, No. 3, p. 24.

Only females are known. A single specimen has been found on the upper surface of the carapace of *Sergestes arcticus* Kr.; its head was directed backwards and situated a little before the posterior end of the carapace. It is highly probable that the parasite always infests that Decapod. The specimens hitherto captured were taken in young-fish trawl or — the Monaco specimen — in a vertical net.

Occurrence. Not taken by the "Ingolf", but by the "Thor" and the "Tjalfe".

Davis Strait: Lat. 66°21′ N., Long. 57°04′ W., depth 680 m., 800 m. wire out; 1 spec. "Tjalfe" (Stephensen).

— — Lat. 64°22′ N., Long. 56°00′ W., 400—800 m. wire out. On *Sergestes arcticus* Kr.; 1 spec. "Tjalfe" (Stephensen).

West of Iceland: Lat. 65°20′ N., Long. 27°12·5′ W., depth 440 m. 820 m. wire out; 1 spec. "Thor".
South of Iceland: Lat. 61°30′ N., Long. 17°8′ W., 1800 m. wire out; 1 spec. "Thor".

Distribution. One specimen has been taken by Dr. Joh. Schmidt west of France in Lat. 48°09′ N., Long. 8°30′ W., 300 m. wire out (Stephensen). The type specimen was secured by the Prince of Monaco at a place south-west of the Azores: Lat. 31°40′ N., Long. 36°55′ W., 2500—0 m. (Koehler).

151. **Holophryxus acanthephyræ** Stephensen.

1912. *Holophryxus Acanthephyræ* Stephensen, Vid. Medd. Nat. Foren. Kjøbenhavn, Vol. 64, p. 112, figs. 15—21 and a part of fig. 13.

Occurrence. The single female of this gigantic parasite was found fixed on the upper surface of the carapace of *Acanthephyra purpurea* A. M.-Edw. var. *multispina* Cout. taken by the "Tjalfe" at the following place.

West of Cape Farewell: Lat. 60°07′ N., Long. 48°26′ W., 2000 m. wire out. (Stephensen).

Aspidophryxus G. O. Sars.

Only a single species is known from our area.

152. **Aspidophryxus peltatus** G. O. Sars.

(Pl. XV, figs. 16 a—16 b).

1883. *Aspidophryxus peltatus* G. O. Sars, Forh. Vid. Selsk. Christiania for 1882, No. 18, p. 72; Pl. II, figs. 12—15.
! 1889. — *Sarsi* Giard & Bonnier, Bull. Sci. France et Belgique, Vol. XX, p. 266—271 and p. 277; Pl. VII, fig. 7, Pl. VIII, figs. 1—6.
! 1898. — *peltatus* G. O. Sars, Account, II, p. 298; Pl. 96.

I have little to add to the excellent figures and description of Sars. The largest female measures 3·4 mm. in the median line. On a small female attached to the dorsal surface of the carapace of *Erythrops serrata* G. O. S. I found a larva in second stage. Sars has figured both the larva and its head from below, but as the last-named figure is too small and indistinct I have drawn the head from below (fig. 16 a). It is seen that the antennulæ differ much from those in *Dajus mysidis*. First joint has in my specimen a part overlapped by the sucking-disk; its outer margin is somewhat sinuate and on the anterior half with three low protuberances, each bearing a seta; second joint is very broad but much shorter than in *Dajus*, with the posterior angle produced into a small, oblong, acute tooth, and the outer margin most peculiarly armed somewhat before the middle — but perhaps this armature belongs to a third joint otherwise not visible; the rami in the main as in *Dajus*. The sucking-disk much smaller than in *Dajus*; it has a moderately narrow rim of pellucid membrane around its whole margin, while an area inside this margin is, as in *Dajus*, finely sculptured. — Hand of seventh pair of thoracic legs (fig. 16 b) much narrower than in *Dajus mysidis*, not quite three times as long as broad; the distal lappet is very short with five long and fine branches; the proximal lappet not visible, but its three branches are well developed. — Length of the larva 0·57 mm.

Occurrence. The material has been gathered by the "Thor" at a single station.

South-West of Iceland: Lat. 63°46′ N., Long. 22°56′ W., 80 fath.; 12 females, most of them with males. Of the females 2 are attached to the back of the carapace of *Erythrops serrata* G. O. S.; a third, large female to the upper side of first peduncular joint of *Mysidopsis didelphys* Norm.; the other females without their hosts.

Distribution. Taken on a specimen of *Erythrops* sp. at Kristineberg, Bohuslän (Stephensen). Not infrequent at the south and west coasts of Norway, northwards at least to Lofoten, on *Erythrops serrata* G. O. S., *E. erythrophthalma* Goës, *E. elegans* G. O. S., *E. microphthalma* G. O. S., *Parerythrops obesa* G. O. S., and *Mysidopsis didelphys* Norm. Furthermore taken at Scotland in the Firth of Clyde and the Upper Loch Fyne, on *Erythrops serrata* and *E. elegans* (T. Scott), and off the west coast of Ireland on *Mysidopsis didelphys*, 112 and 199 fath. (Tattersall).

Family Cryptoniscidæ.

This family comprises the forms on which Giard & Bonnier and later Bonnier established seven families in all: Hemioniscidæ, Cyproniscidæ, Liriopsidæ, Asconiscidæ, Crioniscidæ, Podasconidæ and Cabiropsidæ. It is well known that the male and the second larval stage are completely identical in all external features; excellent characters for genera and species are found above all in the presence or absence of eyes, and in the first joint of the antennulæ and the three posterior pairs of thoracic legs; a somewhat detailed investigation of characters in six forms of larvæ is found in my above-named paper dealing with Isopoda, etc., from the German Plankton-Expedition. The females are always much reduced, but yet in very different degree, and while the majority are free in the marsupia of their hosts, others, viz. *Cyproniscus* and *Liriopsis*, are firmly attached by having a part of their body deeply immerged within the body of their hosts. Unfortunately our knowledge of the females is still extremely poor; of most of the species only a single specimen or very few specimens were found, with the result that the descriptions of these difficult animals are imperfect; furthermore several species of larvæ in the second stage or males were taken pelagically and have been described, but their females and consequently their hosts are unknown. At the present state of our knowledge it seems to me impossible to divide the Cryptoniscidæ into subfamilies based on good characters in both sexes.

The material from our area comprises five species belonging to five genera, and four among these are new. And it may be seen that the extreme difference between the females of two genera found in the marsupium of the same species of Isopoda, while their males are closely allied, seems to increase the difficulties as to a natural classification. Some larvæ in the second stage or males taken pelagically are omitted, as a representation would be of slight value.

Clypeoniscus Giard & Bonnier.

Of the two species known only one has been found in our area.

153. Clypeoniscus Meinerti Giard & Bonnier.

(Pl. XV, fig. 17 a; Pl. XVI, figs. 1 a—1 c).

1895. *Clypeoniscus Meinerti* Giard & Bonnier, Bull. Sci. France et Belgique, Vol. XXV, p. 422—428, p. 444; Pl. VII, figs. 20—21; Pl. VIII, figs. 24, 26—27; Pl. X.

The French Zoologists established contemporaneously *C. Hanseni* on specimens from *Idothea balthica* from Denmark and *C. Meinerti* on specimens from *Synidothea nodulosa* Kr. from West Greenland and Jugor Schar; they had received the material from the Copenhagen Museum. They described the females of both species and the male of *C. Hanseni*, but did not mention the male of *C. Meinerti*. Some specimens of *S. nodulosa* with the parasite from West Greenland are to hand, and the male shall be described presently. But, before doing so, it may be stated that I have found a female with male of the same parasite in the marsupium of the specimen of *Pleuroprion Murdochi* Ben. mentioned on p. 196.

The differences between the females of the two species of *Clypeoniscus* have been pointed out by the French authors, and the female from *Pleuroprion* agrees well with their figs. 20—21. I think, however, that this would scarcely suffice for referring the parasite on *Pleuroprion* to the same species as that on *Synidothea*, but the males agree closely and, besides, differ sharply in an easily observed feature from the male of *C. Hanseni*; therefore I am forced to refer the parasite on *Pleuroprion Murdochi* to *C. Meinerti*.

Giard & Bonnier published a large and good figure (Pl. IX) of the male *C. Hanseni*, and in 1899 Sars published several figures of another Danish specimen. When comparing my figure of the head of *C. Meinerti* (fig. 17 a) with the figures of *C. Hanseni* referred to, it is instantly seen that the first joint of the antennulæ of *C. Meinerti* differs much in shape and size from the same joint in

C. Hanseni as figured by Sars or Giard & Bonnier; furthermore the antennulæ on Sars' figure agree fully with their shape on the French figure, and it may be added that my examination of the antennulæ of a male of *C. Hanseni* showed the figures mentioned to be correct. In *C. Meinerti* the first joint is extremely large, almost twice as broad as long, while in *C. Hanseni* it is considerably less produced backwards, scarcely half as broad again as long; furthermore the front margin of the joint is longer in *C. Hanseni* than in *C. Meinerti*, finally the posterior margin has 11 teeth in both species, but in *C. Meinerti* the teeth are more closely set, and the major part longer than in *C. Hanseni*. Second joint of the antennulæ shows some difference in the armature of the distal margin in the two species, but in the shape of the three posterior pairs of legs (figs. 1 a—1 c) no appreciable specific difference could be discovered. — The males of *C. Meinerti* are about 0·77 mm. long.

Occurrence. The infested specimens of *Synidothea nodulosa* Kr. are from West Greenland, partly from Godhavn, Lat. 69°14' N., partly without special locality, but probably from a more southern locality. The infested specimen of *Pleuroprion Murdochi* Ben. is — see p. 196 — either from Iceland or the Færoes.

Distribution. Jugor Schar, entrance to the Kara Sea, a specimen of *Synidothea nodulosa* Kr. with the parasite (Giard & Bonnier).

Arcturocheres n. gen.

Immature Female. The body (Pl. XVI, fig. 2 a) shaped as an oblong sac, with the mouth much reduced but distinctly seen (fig. 2 b); most of the ventral side divided by six feeble, transverse furrows, and two pairs of minute sublateral legs (*l*) placed respectively a little before and a little behind the middle; each leg is minute, rounded, somewhat plate-shaped, freely protruding and well chitinized.

Male. Differs from *Clypeoniscus* especially in the antennulæ and in the two posterior pairs of thoracic legs. First joint of the antennulæ (fig. 2 e) has only four teeth on the posterior part of the inner margin and on the posterior end. Sixth joint, the hand, of each of the two posterior pairs of legs with two spines at the lower margin; on seventh pair (fig. 2 k) seventh joint constitutes together with the claw a normal, slender and long "claw", but on sixth pair seventh joint (figs. 2 h and 2 i) is quite aberrant, being rather short, unusually deep, and increasing in depth from the base to the end, which is cut off obliquely and has the normal, slender claw inserted at the upper angle on its terminal margin.

Remarks. It was found necessary to establish this genus on a new species parasitic on specimens of the genera *Astacilla* and *Pleuroprion*, as both the male and the female differ materially from the other genera hitherto known.

154. Arcturocheres pulchripes n. sp.

(Pl. XVI, figs. 2 a—2 l).

Immature Female. The single specimen is somewhat compressed, but that may be accidental. As shown in fig. 2 a, the contents form a body more or less removed from the pellucid thin skin excepting at the mouth, where the skin and the inner body are united; that the contents are thus removed from the skin is certainly due to the influence of the alcohol. The contents show no differentiation, as ova are not developed. The reduced mouth (fig. 2 b) could not be really investigated, as the single specimen ought not to be sacrificed. — As to external features, nothing more than is stated in the generic diagnosis could be made out.

Length 3·8 mm.

Male. Slightly more than three times as long as broad (fig. 2 c). Head with the anterior margin broadly and evenly rounded. Eyes wanting. — Antennulæ rather large (fig. 2 d); first joint (fig. 2 e) with the anterior margin moderately short; the outer margin very long, concave to near the convex, short posterior part; posterior margin sinuate; the posterior part of the inner margin is serrate, with two large, oblong, blunt teeth, and at each side of these a smaller, acute, triangular tooth. Second joint proportionately large, with the anterior margin long and terminating in an acute tooth; the terminal part of the joint divided by linear incisions from the outer margin into four lobes, and two triangular protuberances are seen on the lower surface, not far from the margin. A bundle of very long sensory setæ has, seen from below, its proximal part overlapped by the lobes mentioned, as the part of the third joint bearing these hairs is completely covered, while the two rami belonging to third joint are well developed. — The antennæ reach about to the middle of fifth thoracic segment.

Thoracic segments with the anterior pairs of epimera scarcely serrate, the posterior pairs distinctly serrate on their hind margin. — First (fig. 2 f) and second pairs of legs with the hand thick and somewhat short, yet more than half as long again as deep. Fifth pair (fig. 2 g) rather slender; the hand nearly four times as long as deep, deepest somewhat from the end, and there with a tiny tooth on the lower margin, and near that tooth about three spines project on the posterior surface; seventh joint scarcely marked off from the claw, and both combined a little more than half as long as the hand. Sixth pair (figs. 2 h and 2 i) differ much from fifth or seventh pairs; the hand is about five times as long as deep, broadest at the base, tapering to the rather narrow end, and with two spines near the lower margin; seventh joint, which is most peculiar, has been mentioned in the diagnosis of the genus, and it may be added that it is somewhat more than one-third as long as the sixth joint, and a distal area, marked off on the figure by a thin line, is quite thin and pellucid; the slender claw is about one-third as long as seventh joint. Seventh pair (fig. 2 k) have the hand nearly more than five times as long as deep, with two spines near the lower margin, but it is deepest at the middle and distally slightly tapering; seventh joint with claw claw-shaped, about two-thirds as long as sixth joint. — Pleopods normal (fig. 2 l), with both rami well developed. Sixth abdominal segment without teeth on the posterior margin; the uropods have both rami marked off by articulation.

Length 1·6 mm.

Occurrence. Found in the marsupium of *Astacilla granulata* G. O. S. and *Pleuroprion hystrix* G. O. S.; the hosts have been taken by the "Ingolf".

South-East of Iceland: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5°; 1 specimen of *Astacilla granulata* G. O. S. with a female and a male parasite in the marsupium.

West of the Færoes: Stat. 44: Lat. 61°42' N., Long. 9°36' W., 545 fath., temp. 4·8°; a specimen of *Pleuroprion hystrix* G. O. S. which has the marsupium filled with eggs, and the male (or larval) parasite was found with its posterior part of the body uncovered, while its anterior part was penetrating the front end of the marsupium.

Astacilloechus n. gen.

Immature Female. Body (fig. 3 a) oblong, a little more than twice as long as deep, about from the middle tapering considerably to the first thoracic segment and much to the subacute end of the abdomen; furthermore, the body is much curved and divided by conspicuous constrictions and furrows into twelve segments; the animal is somewhat similar to the limbless larva of an Insect. Seen from the side, the major upper part of the front margin of the animal is somewhat deeply concave, as the lower part of first segment protrudes as a rounded portion. Seen from below (fig. 3 b) the first segment is nearly three times as broad as long, with the anterior margin long and nearly straight towards the broadly rounded antero-lateral angles, while its lower surface is broadly excavated longitudinally, and in the median line at the base protrudes a somewhat small semiglobular body, which must be the head and has a thin and at least two-jointed antenna at the side, but some chitinous strips on the head I was unable to interpret. The thoracic segments without any vestige of legs; the uropods quite inconspicuous.

Male. In all features similar to that of *Arcturocheres*, excepting that the posterior part of the inner margin of first joint of the antennulæ has six acute teeth.

Remarks. The female with the male were found in the marsupium of a specimen of *Astacilla granulata* taken together with the specimen infested with *Arcturocheres pulchripes*. While the female differs so much from that of *Arcturocheres* that one might be tempted to place them in different subfamilies, the males of the two forms differ only in small particulars, the most essential being the number of teeth on first joint of the antennulæ. This is, in my opinion, most remarkable. Unfortunately I had only a single and, judging from the contents, far from mature female of each of the two genera, and my investigation is most unsatisfactory, but I found it impossible to arrive at better results. And I thought it advisable not to omit either of the two forms, but to communicate my observations, so that they might serve future investigators, who may have a rich material of deep-sea forms of *Astacilla* and allied genera, as a help and warning in the look out for the Cryptoniscidæ.

155. **Astacilloechus Ingolfi** n. sp.

(Pl. XVI, figs. 3 a—3 d).

Immature Female. Nothing is to be added to the generic description, excepting that the animal measured along the middle of the side is about 3·5 mm. long, consequently of considerable size.

Male. Very similar to the male of *Arcturocheres pulchripes* in size, shape, antennæ, epimera, three posterior pairs of thoracic legs, and last abdominal segment, so that only the few differences observed need be mentioned.

The antennulæ (fig. 3 c) show a few differences. First joint is longer in proportion to breadth, the outer margin less concave, the anterior part of the postero-lateral margin has a sharp angle and two minute, low, rounded teeth; nearly the posterior half of the inner margin is curved considerably outwards and has six acute teeth, the two anterior somewhat small, the three posterior much larger and oblong-triangular; finally a small rounded plate with two short hairs protrudes at each side of the terminal tooth. Second joint is nearly similar to that in *A. pulchripes*, but third joint protrudes (at least in my specimen) beyond the outer margin of second joint, and bears a beautiful fan-shaped bundle of sensory filaments. — Sixth pair of legs (fig. 3 d) as in *A. pulchripes*, excepting that sixth joint is a little more elongate.

Length 1·58 mm.

Occurrence. Found in the marsupium of a specimen of *Astacilla granulata* G. O. Sars taken by the "Ingolf".

South-East of Iceland: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2·5; 1 spec.

Parapodascon n. gen.

Female. Body (fig. 4 a) ovate both from below and from the side, without legs, but the central half of the ventral median line shows organs, viz., in front a pair of minute conical antennulæ, rudiments of a mouth, and along the median line five pairs of rounded lobes, all very short, the first pair, besides, narrow and the others broad, and between these rows of lobes are seen some few of the eggs from the incubatory cavity.

Male. Eyes wanting. The antennulæ of very moderate size (fig. 4 c); first joint with several obtuse teeth along the posterior margin; second joint with some acute teeth along the same margin. All epimera posteriorly divided into a number of comb-teeth (fig. 4 c). The three posterior pairs of legs (figs. 4 e—4 g) characteristic; the hand with a single marginal spine; seventh joint long and slender, in sixth pair (fig. 4 f) longer than in the two other pairs and distinctly expanded at the end; the claw very slender, well marked off and moderately long.

Remarks. This genus is established on a species in all probability identical with *Podascon (?) Stebbingii* Giard & Bonnier, a name given by the French authors to a male described and figured by Stebbing. The female differs so widely from that of the genus *Podascon* Giard & Bonn., that a new genus was necessary for the reception of the species described below. The male of *Podascon* is unknown, and not only were the French authors uncertain, but Sars entertained grave doubt whether the male described by Stebbing belonged to *Podascon* or to another genus.

156. **Parapodascon Stebbingii** Giard & Bonnier.

(Pl. XVI, figs. 4 a—4 g).

1894. Description and figures without name in: Stebbing, The Amphipoda coll. during the voyages of the Willem Barents; Bijdragen tot de Dierkunde, Afl. 17, p. 46—47.

1895. *Podascon (?) Stebbingi* Giard & Bonnier, Bull. Sci. France et Belgique, Vol. XXV, p. 456. (Translation of Stebbing's text, with his figures).
1899. *Cryptoniscid No. 1*, in G. O. Sars, Account, II, p. 244; Pl. 100, fig. 2.

Female. Nothing can be added to the brief generic diagnosis; fig. 4 a shows all that could be seen on the specimen, which is 2·4 mm. long.

Male. Body somewhat robust (fig. 4 b), about three times as long as broad. Head with the front margin broadly and evenly rounded. — Antennulæ (fig. 4 c) considerably smaller than in the preceding forms; first joint (fig. 4 d) with the anterior margin of very moderate length, outer margin long and somewhat concave, posterior margin and the most posterior part of the inner margin with in all seven teeth, all with the end obtuse, excepting the anterior triangular tooth on the inner margin and the outer tooth on the posterior margin; the fourth tooth, counted from the outer margin, is much broader than the others. Second joint proportionately somewhat large, with the anterior margin very long and much longer than the outer margin, which has four saw-teeth, all acute and, excepting the posterior tooth, low and very oblique; the two rami subequal in length. — Antennæ normal, reaching nearly beyond the middle of fifth thoracic segment (fig. 4 b).

The comb-teeth are very conspicuous on all pairs of epimera. The three posterior pairs of thoracic legs have a tiny spine at the middle of the lower margin of the hand. On fifth pair (fig. 4 e) the hand is about four times as long as deep, distinctly curved, somewhat tapering from before the middle to the moderately broad, truncate end; seventh joint a little more than half as long as the hand, normally shaped, and a little more than twice as long as the claw. In seventh pair (fig. 4 g) the hand is straight and a little more slender than in fifth pair, the claw is longer and extremely thin, but otherwise these distal parts are nearly as in fifth pair. Sixth pair (fig. 4 f) are more aberrant; the hand is distinctly narrower, and tapers considerably from near the base to the narrow end; seventh joint is somewhat longer than in the other pairs, very slender, but widens a little at the distal end, which shows a structure about as in *Arcturocheres* though much less developed; the claw as long as in fifth pair. — Pleopods, sixth abdominal segment, and uropods nearly as in *Arcturocheres pulchripes*.

Length 1·06 mm.

Remarks. It is after prolonged hesitation that I refer the specimens examined to *Podascon (?) Stebbingii* G. & B., as established by the French authors on Stebbing's description and figures of a male taken in the marsupium of *Onisimus plautus* Kröyer, which generally occurs in very moderate depths. My specimens, female and male, were taken in the marsupium of *Onisimus leucopis* G. O. Sars, a deep-sea species of the same genus, which rendered the reference of its parasite to a species occurring on a host from much lower water less advisable, but Stebbing's figure of the right antennula and its teeth agrees so closely with that found in my specimen, that I must consider the males seen respectively by Stebbing and by me as belonging to the same species. Sars has decribed and figured a Cryptoniscid and says that he had found specimens both in Plankton samples and in the marsupium of *Onisimus plautus*, but his figure of the antennula differs considerably from mine, and differences are also found between his figures of the posterior pairs of legs and corresponding figures of mine, but it is impossible to decide whether the differences originate from inaccuracies in his figures, or if the specimen figured by him in reality is an animal taken pelagically and belongs to a species allied to that parasitic on *Onisimus plautus.*

Occurrence. The female and male described were found in the marsupium of *Onisimus leucopis* G. O. Sars taken by the "Ingolf" at the following station.

North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1.0°. Furthermore the "Ingolf" captured a larva in second stage at the following place.

North of the Færoes: Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0.6°.

At West Greenland Cand. mag. K. Stephensen captured in Skovfjord a similar larva in a Nansen net, 250—200 m.

It may be mentioned here that in the marsupium of a specimen of *Anonyx nugax* Phipps captured by Mag. R. Hörring in Faskruds Fjord (East Iceland), 20—50 fath., I found a female certainly belonging to the genus *Parapodascon*, but whether it belongs to *P. Stebbingii* or to a hitherto unknown species cannot be decided, as the male is wanting, and the female seems to be somewhat misshapen from pressure.

Distribution. Stebbing found the male on *Onisimus plautus* Kr. from the Barents Sea, Lat. 70°30′8″ N., Long. 49°41′5″ E., 52 fath. G. O. Sars states that he found the male on *O. plautus* at Bodö, Finmark, furthermore in Plankton taken off the Nordland coast and in the glacial sea north of Siberia. T. Scott recorded the male from gatherings near Cape Flora, Northbrook Island, Franz-Joseph Land.

Cumoechus n. gen.

Adult Female. Nearly globular (Pl. XVI, fig. 5 a). Half or more than half of the breadth of the ventral side occupied by a peculiar longitudinal area stretching itself over nearly the whole length of the surface; the major anterior part of this area is cleft along the middle, the margins of this cleft being the margins of the thorax reaching one another, as the thorax is, as in *Clypeoniscus*, strongly curved in order to constitute an incubatory cavity. Each half of this thoracic area is at its outer margin raised distinctly above the adjacent surface of the body, and it is divided into six subareas by impressions or furrows directed from the median cleft outwards and somewhat forwards. The subareas increase somewhat in breadth from the first to the third and then decrease less to the sixth. The first subarea shows near the inner margin on the surface a small lobe with the inner margin semicircular and free, and not far from the outer margin of the area originates a leg (tr^2), which is four-jointed with the first joint long and somewhat thick, the second considerably thinner and not half as long as the first, the third as long as the second but much more slender, and the fourth quite small; this appendage is probably second thoracic leg. When all eggs or young have been taken out of a female, the part in front of second pair of thoracic legs can be examined, and we find quite minute antennulæ (fig. 5 b, a^1), a seemingly unpaired lamella (l^1), two pairs of lamellæ (l^2, l^3) and a pair of appendages which seem to be six-jointed and almost certainly are the first pair of thoracic legs (tr^1). The basal joint of these legs is thick, and nearly as long as the other very slender joints combined.

The lamellæ are more difficult to interpret, as I would not sacrifice to some degree more than a single old female and have no younger female; I suppose that the lamella marked l^2 on fig. 5 b is a reduced and collapsed antenna without contents, and the lamella marked l^3 probably the marsupial lamella belonging to first pair of legs. — The surface of the thorax outside the ventral area described shows rudiments of divisions into segments.

Behind the thoracic part of the ventral area is found the abdominal part (fig. 5 a, *ab*) which is a moderately chitinized plate much broader than long, and divided in almost the anterior half of its median line by a cleft; this abdominal plate is not divided into segments excepting near the cleft, where each narrow segment projects inwards as a process, so that the incubatory cavity is closed here by these processes, which in natural position are situated as if one places the fingers of one's two hands alternately between each other.

Male. Body extremely elongate (fig. 5 c). Head much produced; no eyes. — Antennulæ (fig. 5 d) placed far forwards, somewhat small, but first joint extremely produced posteriorly (fig. 5 e), with a number of slender and posteriorly long teeth on the major part of the inner margin, and some long and slender comb-teeth on the extremely oblique posterior margin; second joint with the distal part divided into some teeth; third joint with the anterior ramus short, the posterior long. Antennæ normal, with four joints in the peduncle and five in the flagellum. — Mouth placed far backwards between the side-plates of first thoracic segment (fig. 5 d); the figure shows that mouth-parts are distinct, but I do not venture an interpretation.

Thoracic epimera in part divided by very deep incisions into several teeth (fig. 5 d). Thoracic legs characteristic; the three anterior pairs (fig. 5 f) somewhat slender, and their hand with two spines at the prehensile margin; the four posterior pairs (figs. 5 g and 5 h) subsimilar and extremely slender, with the hand (sixth joint) very long and narrow, and bearing a single minute spine a little before the middle of the margin; seventh joint and claw combined as long as the hand, but seventh joint thin and three to four times as long as the claw. — The five anterior abdominal segments with each postero-lateral angle produced into a slender, spiniform process about two-thirds as long as the next segment; pleopods with both rami movable, subsimilar in shape, very oblong, more than twice as long as broad. — Last thoracic segment, seen from above (fig. 5 i), triangular with the major part of each postero-lateral margin divided into five long comb-teeth, and the pair at the median line are extremely long and slender. — Uropods with the rami very long, the exopod distinctly thinner and somewhat or a little shorter than the endopod, and the ends of both rami are divided by narrow incisions into comb-teeth (fig. 5 i).

First larval Stage (fig. 5 k). Body very oblong-ovate. Antennulæ somewhat small, 2-jointed. Antennæ about as long as the thorax, 4-jointed, and the longest of its terminal setæ half as long again as the body. Hand of the thoracic legs oblong, with a spine at the base of the prehensile margin and the "claw" short. Pleopods elongate, especially their rami, and the terminal setæ very long. Uropods with the rami slender, long, and the exopod distinctly longer than the endopod; longest terminal seta about as long as the body. Between the base of the uropods is seen a small, triangular process, the "anal tube".

Remarks. This genus is extremely interesting. The female, though very different from *Cly-*

prouiscus, shows some relationship to that genus, especially in the antennulæ, the two anterior pairs of thoracic legs and the ventral cleft. But having no subadult female I am unable to interpret the anterior pairs of lamellæ with certainty. The male differs much in several features from all males of this family hitherto known; especially the extreme slenderness and the antennulæ are interesting. The first larval stage, taken from the incubatory cavity, shows fine characters in outline and length of some appendages and setæ, but no structural feature of peculiar interest.

Occurrence. The animals are found in the marsupium of Cumacea belonging to the genera *Diastylis* and *Hemilamprops*, and inhabiting depths of several hundred fathoms. Formerly (1897) I published descriptions of several parasitic Copepoda of the family Choniostomatidæ living either in the marsupium or in the branchial cavity of Cumacea. Thus members of this order are infested with parasites of the same two families as were previously known from the marsupium of Isopoda and Amphipoda. — The specimens I have found in different species of hosts seem to belong to the same species.

157. **Cumoechus insignis** n. sp.
(Pl. XVI, figs. 5 a—5 k).

Female. Scarcely anything of interest can be added to the generic description. The animal figured (fig. 5 a) is 2·5 mm. long and 2·8 mm. broad.

Male. Body (fig. 5 c) somewhat less than five times as long as broad. Head nearly longer than broad, much produced, with the front end narrowly rounded. — First joint of the antennulæ (fig. 5 e) produced extremely backwards, so that it is several times broader than long; its anterior angle is somewhat broadly rounded, and the anterior margin is somewhat short and very oblique; the outer margin, counted from the front angle to the first comb-tooth, has its anterior half deeply concave; the posterior margin, which is very oblique, has four very long and slender comb-teeth directed backwards and a little outwards, and a fifth still longer and distinctly stronger process from the posterior end; the intervals between the four first-named teeth are narrow incisions, but between the last tooth and the terminal process is found an interval as if an intermediate tooth had been lost, but instead of a tooth a seta is found; the inner margin of the joint is extremely long and very feebly convex, with its short anterior part straight, and behind this part nine or ten processes are found; these processes are extremely oblique and acute, and increase in length but not in breadth from the anterior first tooth to the eighth or ninth, which is long. Second joint is directed somewhat outwards and much backwards; it is long, more than three times as long as broad; its terminal margin is divided into four acute processes increasing much in length from the first to the fourth, which is long and somewhat robust; the lower surface of the joint has, before the base of the posterior process another, moderately long, acute process, and a tooth in front of the base of the last-named process. Third joint, excepting the rami, not visible from below, but it has numerous very long sensory filaments (omitted on fig. 5 e, but shown on fig. 5 d), and the posterior ramus is very long. — The antennæ (figs. 5 e and 5 d) reach beyond the middle of fifth thoracic segment; the terminal margin of second, third, and fourth peduncular joints is divided into teeth. — As to the thoracic and abdominal segments and their appendages scarcely anything needs to be added to the description in the diagnosis of the genus.

Length of a male from *Diastylis polaris* G. O. S. 1·1 mm., of a male from *Diastylis echinata* Bate 0·86 mm.

Only two males were seen by me, and I found the following differences between them. The male from *Diastylis polaris* is, as just stated, longer, with only nine processes on the inner margin of first joint of the antennulæ, five pairs of comb-teeth on the last abdominal segment and no rudiment of a sixth pair (fig. 5 i), finally the exopod of the uropods is only a little shorter than the endopod. The male from *Diastylis echinata* is smaller, with ten processes on the inner margin of first joint of the antennulæ (fig. 5 e), five pairs of long comb-teeth and rudiments of a sixth pair on the last abdominal segment, while the endopod of the uropods is somewhat longer than the exopod. According to my experience from the second larval stage in Bopyridæ and *Dajus mysidis* I do not suppose that these differences are specific characters, but being unable to decide the question with absolute certainty, especially as the large male is from the cold and the other from the warm area, I will point out the facts.

First Larval Stage (fig. 5 k). The description above may be sufficient, as the number and length of the setæ on the antennæ and the uropods may be seen on the figure. The body of such a larva is only 0·17 mm. long.

Occurrence. Found in the marsupium of *Diastylis polaris* G. O. Sars taken by the "Ingolf" at two stations in the cold area.

South of Jan Mayen: Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 1 female, 1 male.

North-West of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath.; temp. ÷ 0·6°; 1 female.

Furthermore in the marsupium of two specimens of *Diastylis echinata* Bate and of three specimens of *Hemilamprops cristata* G. O. S., all captured by the "Thor" at the following station in the warm area.

South-West of the Færoes: Lat. 61°08′ N., Long. 9°28′ W., 436 fath.; 5 females, 1 male.

Sub-Order *Gnathiidea.*

As already stated on p. 4 I have found it necessary to remove the family Gnathiidæ from the sub-order Flabellifera and to establish it as a sub-order, as it differs in important characters from all other families of the order and occupies an isolated position. — Only one valid genus is represented in the material.

Gnathia Leach.

In 1901 A. Dollfus established the new genus *Caecognathia* for the reception of *Gnathia stygia* G. O. S. and a new species, but the latter must, however, be cancelled as founded on features due to individual variation. The only difference between *Caecognathia* Dollf. and *Gnathia* Leach is the total absence of eyes in the former genus, while well developed eyes are found in the latter genus; Dollfus also mentioned the strong teeth on the body of *C. stygia* as a generic character, but as two completely blind new species described later on have the body more smooth than some of the species of *Gnathia*, and as these new forms do not afford any other generic difference from *Gnathia*, the armature with teeth or processes in *C. stygia* cannot be included in the generic diagnosis for *Caecognathia*. And to establish a genus of such animals as *Gnathia* only on the absence of eyes would be about as incorrect as separating the blind species of *Munna* from this genus.

New species of *Gnathia* ought to be established on the males; in the females of different species it is not unfrequently difficult to point out reliable specific characters, and at the present state of our knowledge many of the larvæ cannot be referred to species with real certainty. The males of several species show considerable individual variation, especially as to size and degree of scabrosity, which renders the description and determination far from easy. One of the most important characters, viz., the shape of the frontal margin of the head, is frequently difficult to make out, and the proximal half of the upper margin of the mandibles ought always to be inspected from the side.

The material comprises male specimens of seven species, two of them new; the following key may be a help for the determination. It may be mentioned here that neither *G. maxillaris* Mont. nor *G. oxyuræa* Lilljeborg[1] are known from our area, though I suppose that the last-named form may live at the Færoes.

A. Eyes well developed.

a. Proximal half of the upper margin of the mandibles only with a protruding angle at the end. Dorsal surface of the thorax and especially of its posterior segments with conspicuous irregular depressions .... 1. *G. elongata* Kr.

b. Proximal half of the upper margin of the mandibles with some irregular teeth. Thoracic surface not areolated from depressed areas.

α. Front margin of the head at the middle with a small protuberance, or feebly concave.

§. Head and thoracic segments with very few and short setæ. Major distal part of the last abdominal segment is shaped as a narrow triangle .... 2. *G. robusta* G. O. S.

§§. Head and at least the three anterior free thoracic segments with a good number of long setæ. Major distal part of the last abdominal segment is shaped as a moderately broad triangle.. 3. *G. hirsuta* G. O. S.

β. Front margin of the head at the middle with a deep and moderately broad incision. (Major distal part of last abdominal segment is shaped as a narrow triangle). 4. *G. abyssorum* G. O. S.

B. No eyes.

a. Tergite of the penultimate leg-bearing thoracic segment not divided in the median line. Sides of the thoracic segments without processes or teeth, at most some of them with a few granules. Small forms.

[1] In the list of the Danish species of most orders of Malacostraca (Vid. Medd. Naturh. Forening Kjöbenhavn for 1909) I have made an error which may be corrected here. I referred the Danish specimens of *Gnathia* to *G. maxillaris* Mont. as figured and described by G. O. Sars (Account, II. p. 52; Pl. 21; Pl. 22, fig. 1) which is correct, but I overlooked that Norman in 1906 had pointed out that *G. maxillaris* Mont. is another species, and that the species described by Sars, consequently also the Danish specimens, must be named *G. oxyuræa* Lilljeborg. A few months ago I looked over the entire material from Denmark and found that all specimens belong to the last-named species.

α. Head just behind the insertion of the antennulæ about as broad as near the middle of its lateral margins. Last abdominal segment about as long as broad at the base. 5. *G. albescens* n. sp.

β. Head just behind the insertion of the antennulæ much narrower than at the middle of its lateral margins. Last abdominal segment much longer than broad at the base.

6. *G. bicolor* n. sp.

b. Tergite of the penultimate leg-bearing segment divided in the median line. Sides of the thoracic segments with teeth and processes. Large species .... 7. *G. stygia* G. O. S.

158. **Gnathia elongata** Kröyer.

?1846. *Anceus elongatus* Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. 30, figs. 3 a—3 g.
1847. — — Kröyer, Naturh. Tidsskr. Ny Række, Vol. II, p. 388.
! 1897. *Gnathia elongata* G. O. Sars, Account, II, p. 55; Pl. 23, fig. 1.

The male is easily distinguished by the dorsal depressions, and it has been well figured by Sars. Among the considerable material from Ameralik Fjord, West Greenland, I found a single male which looks rather different, as the head is distinctly longer and more quadrangular than in other specimens, the dorsal depressions on the penultimate leg-bearing segment less developed and on the last segment nearly wanting, while the last abdominal segment is conspicuously shorter than the uropods, and its major distal part shorter than usual; I suppose, however, that this specimen has been anomalously developed, so that the differences mentioned cannot be taken as due to normal variation, and for various reasons I cannot think that the specimen may belong to another, hitherto unknown species.

The female, which has been well figured by Sars, can be separated from those of the following eye-bearing forms by the more slender body — frequently more slender than that figured by Sars — by the strong setæ on the produced lateral angles of the five anterior abdominal segments, together with the setæ on the front part of the head.

Occurrence. The "Ingolf" has captured *G. elongata* at seven places.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3·9°; 3 spec. (♂)

West Greenland: Mouth of Ameralik Fjord, Lat. 64°03′ N., 5—70 fath., 14 spec. (7 normal ♂, 1 anomalous ♂).

East Iceland: Seydis Fjord, in a fishing net; 1 spec. (♀).

East of Iceland: Stat. 59: Lat. 65°00′ N., Long. 11°16′ W., 310 fath., temp. ÷ 0·1°; 1 spec. (♀).

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 4 spec. (1 ♂, 3 larvæ).

South of Jan Mayen: Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷ 0·4°; 11 spec. (4 ♂).

Jan Mayen: Stat. 115: Lat. 70°50′ N., Long. 8°29′ W., 86 fath., temp. 0·1°; 6 spec. (4 ♂, 2 ♀).

Furthermore it has been secured at a number of places in our area by several zoologists. Vanhöffen has recorded it from Lille Karajok Fjord, West Greenland, Lat. 70°30′ N. At East Greenland it has been taken by the Ryder Exp. at Tasiusak, Lat. 65°37′ N., and at Lat. 69°25′ N., Long.

20°01′ W., 167 fath.; by the IInd Amdrup Exp. in Forsblad Fjord, Lat. 72°17′ N., 90—40 fath. At East Iceland it has been taken by Mag. R. Hörring in Faskruds Fjord, 50—20 fath., and by the "Thor" in Röde Fjord, 70 fath. Finally the "Thor" captured a male south-west of the Færoes in Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.

Distribution. Sars recorded it as occurring "along the whole Finmark coast" and "southwards to the Lofoten Islands"; furthermore from a station near Jan Mayen, 70 fath., temp. ÷ 0·6°, and from a station between Finmark and Beeren Eiland, 191 fath., temp. 3·5°. Ohlin mentioned it from two places at Spitzbergen, in depths from about 35 to 60 fath.; the "Dijmphna" captured it in the Kara Sea, 49 to 64 fath. (H. J. Hansen).

The localities enumerated show that *G. elongata* has a wide distribution and lives in depths from a couple of fathoms down to about 500 fath., most frequently in temperatures above zero, but also in temperatures down to at least ÷ 0·6°.

159. **Gnathia robusta** G. O. Sars.

(Pl. XVI, figs. 6 a—6 b).

1879. *Anceus robustus* G. O. Sars, Arch. Math. og Naturv. Vol. IV, p. 432.
! 1885. — — G. O. Sars, North-Atl. Exp., Crust. I, p. 94; Pl. 8, figs. 25—27.

The authorities of the University Museum in Christiania kindly lent me Sars' material, and an examination of the 8 males rendered some results. The males vary considerably in size, the largest being 6·6 mm. and the smallest only 4·3 mm. long, the mandibles not included. Somewhat less than the proximal half of the upper side of the mandibles is raised as a kind of longitudinal keel always armed with four to six triangular teeth (fig. 6 a), a feature overlooked by Sars. The front margin of the head has at the middle a somewhat small or minute, more or less low, rounded or acute median projection. The eyes are somewhat small. — Head and thorax proportionately broad as figured by Sars, but the degree of seabrousness originating from small teeth and sharp granules varies considerably, as in some smaller specimens the two posterior segments are nearly smooth, and the convex sides of the head, which in the largest specimens have numerous conspicuous acute teeth, have only a few teeth or are nearly smooth in some other specimens. The thoracic segments have very few and short setæ on the sides. — The abdominal segments either naked or with very few and short lateral setæ; the major distal part of last segment is a narrow triangle as figured by Sars.

The four males from the Danish expeditions agree as to size, structure, variation, etc. completely with those mentioned. The median part of the front margin of the head is always distinctly produced as a triangle, which is conspicuously broader than long and in one specimen very short and rounded, while in another specimen this produced lamellar part has the margin somewhat irregular and the end itself feebly emarginate.

The female, which has not been described by Sars, is extremely thick, considerably thicker than in *G. elongata* Kr. or *G. abyssorum* G. O. Sars; it differs from both in having the anterior part of the head (fig. 6 b) less produced, with the emargination considerably broader than in those females. It differs from *G. elongata* and agrees with *G. abyssorum* in having nearly no setæ on the front part of the head and in the shape of the last abdominal segment, the major part of which is a narrow triangle; the sides of the abdominal segments have some few setæ. — Length nearly 6 mm.

Occurrence. The "Ingolf" has secured this species twice.

West of Iceland: Stat. 9: Lat. 64°18' N., Long. 27°00' W., 295 fath., temp. 5·8°; 1 spec. (♂).

Without locality in a calcareous sponge; 4 spec. (1 ♂, 2 ♀, 1 larva).

Furthermore it has been taken in Baffin Bay at Lat. 72°32' N., Long. 58°5' W., 116 fath., by the Swedish expedition in 1871 (1 ♂ borrowed from the Riksmuseum in Stockholm). The Ryder Exp. captured it twice, viz. off East Greenland at Lat. 69°25' N., Long. 20°1' W., 167 fath., 3 spec. (1 ♂, 1 ♀, 1 larva), and near Jan Mayen at Lat. 70°32' N., Long. 8°10' W., 470 fath., 1 spec. (♂).

Distribution. Taken by the Norwegian North-Atl. Exp. at two stations, viz. midway between Finmark and Beeren Eiland, 191 fath., temp. 3·5°, and west of Spitzbergen, Lat. 78°2' N., 416 fath., temp. 0·8°. Dollfus recorded it from a place a little north of the first-named Norwegian station viz. from Lat 72°37' N., Long. 17°40' E., 209 fath.

160. **Gnathia hirsuta** G. O. Sars.

(Pl. XVI, figs. 7 a—7 b).

1877. *Anceus hirsutus* G. O. Sars, Arch. Math. og Naturv. Vol. II, p. 349.

! 1885. — — G. O. Sars, North-Atl. Exp., Crust. I, p. 92; Pl. 8, figs. 23—24.

! 1888. — *cristatus* H. J. Hansen, Vid. Medd. Nat. Forening i Kjøbenhavn for 1887, p. 182; Pl. VII, figs. 2—2 a.

In the paper quoted I established *A. cristatus* on a single male without abdomen from Baffin Bay. The name was derived from the fact that the upper side of the proximal half of the mandibles was raised as an irregularly incised and dentate crest. I wrote: "*Anc. hirsuto* G. O. Sars sat affinis, structura mandibularum a speciebus omnibus mihi cognitis diversa", and by these words I referred to the dentate crest mentioned; on *A. hirsutus* Sars had said (p. 93) on the mandibles: "On the outer margin, occurs, about in the middle, a distinct, though small, dentiform projection", and on the mandibles in *A. robustus* (p. 95) ".... the outer edge smooth, without any perceptible dentiform projection". The specimen of my *A. cristatus* belonged to the Riksmuseum in Stockholm, but according to information from the Director of the Department it could not be found, which is unfortunate, as I now think that the median part of the front margin of the head was somewhat incorrectly drawn by me in 1887. The specimen measured without abdomen 3·1 mm., and according to the relative length of abdomen as compared with head plus thorax in allied forms the abdomen has measured 1·2 or 1·3 mm., thus the whole animal must have been 4·3 or 4·4 mm. Consequently it cannot belong to *G. abyssorum* G. O. S., which is only 2·5—3·5 mm. long, but either to *G. robusta* or to *G. hirsuta*, or be distinct from both. It cannot belong to *G. robusta*, because its body is proportionately more narrow, and the thoracic segments have, as shown in my figure in 1887, a good number of somewhat long lateral setæ, while *G. robusta* has only very few and short lateral setæ.

The Director of the Museum in Christiania kindly lent me in 1915 the types of *G. hirsuta* G. O. S., and I found, what I now had expected, that the proximal half of the outer upper part of the male mandibles is raised as a crest, which is irregularly dentate above; the two males measured 5·2 and 5·4 mm. in length, the mandibles not included. And the result of this detailed account is that I can now safely refer *G. cristata* as a synonym to *G. hirsuta*.

From the "Ingolf" I have two fine males belonging to *G. hirsuta*. Both specimens are 5 mm. long, conspicuously narrower than *G. robusta* G. O. S., not quite three times as long as broad; the sides of the head (fig. 7 a) and thorax have numerous long, outstanding setæ, and long setæ are furthermore found on the lateral, much protruding parts of fourth and fifth abdominal segments and on the uropods (fig. 7 b). Last abdominal segment is distinguished by the shape of its major posterior part, which is a much broader triangle than in *G. robusta* or *G. abyssorum*. — And some additional notes may be made on these specimens. The eyes are somewhat small (fig. 7 a). The proximal half of the mandibles above with a conspicuous crest irregularly adorned with several teeth. The head is anteriorly conspicuously produced at the middle, and the median anterior half of the surface evenly excavated; the front margin is in one specimen (fig. 7 a) feebly concave, in the other distinctly longer with a low triangular median protuberance. One specimen agrees with that figured by Sars in having the surface of the posterior part of the third, and of the whole fourth and fifth leg-bearing segments smooth, while in the other specimen these segments have numerous small but very distinct spikes.

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

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3·3°; 4 spec. (2 ♂ and 2 young larvæ).

The specimen described as *A. cristatus* has been taken in Baffin Bay in Lat. 72°32′ N., Long. 58°05′ W., 116 fath. Finally recorded by G. O. Sars from a station somewhat south-west of Jan Mayen, Lat. 70°41′ N., 263 fath., temp. ÷ 0·3°.

Distribution. Taken by the Norwegian North-Atl. Exp. west of Norway in Lat. 63°10′ N., 417 fath., temp. ÷ 1·0°.

161. Gnathia abyssorum G. O. Sars.

(Pl. XVI, figs. 8 a—b).

1897. *Gnathia abyssorum* G. O. Sars, Account, II, p. 56; Pl. 23, fig. 2.

1913. — *schistifrons* Stebbing, Transact. Zool. Soc. London, Vol. XX, Pt. 4, p. 233; Pl. XXIV B.

Thanks to the authorities of the Christiania Museum I have examined the males investigated by Sars, three specimens in all, but his description and figures were found to be misleading as to two important features. Sars said nothing on the front median part of the head, but his figure shows only a deepening of the broad front part of the upper surface, while the front margin is figured as being a little convex with a small median tooth and a pair of minute submedian teeth. But his animals differ as to these features strongly from his figure and agree with that drawn from one of my specimens (fig. 8 a). It is seen that the surface is hollowed longitudinally in its anterior and somewhat narrow median part, and the surface shows in front a rather broad and deep, at the base rounded, incision, and the angle of the front margin at each side of the incision is produced in a rounded knot. My figure shows most of the incision dark, which is due to the fact that the lower wall of the head projects so far forwards that it covers below most of the incision mentioned when the head is seen vertically from above; if the head is seen obliquely from above and somewhat from behind, the incision is extremely conspicuous, as the cover below cannot be seen. The lower wall of the head has in the specimen figured (fig. 8 b) its front margin somewhat convex; in a single specimen this margin is indistinctly concave. — The other error committed by Sars is that he has overlooked the fact that the upper side of the mandibles has a shorter or longer part of its proximal two-fifths raised as a crest with about four to six teeth. — The major distal part of last abdominal segment is, as figured by Sars, a very narrow triangle.

Stebbing established his *G. schistifrons* on a single specimen, deriving the name from and laying stress on "the frontal excavation, by which it is easily distinguished from its nearly allied Norwegian species *Gnathia abyssorum* G. O. Sars". Of course, he could not know that Sars had overlooked that incision. — In other respects Sars' figures are satisfactory, and it is sufficient to refer to them, to his text, and to the detailed description with many figures published by Stebbing. — The species is small; the male only from about 2·5 to 3·5 mm. long.

Occurrence. Taken by the "Ingolf" at three stations in the warm area.

West of Iceland: Stat. 9: Lat. 64°18′ N., Long. 27°00′ W., 295 fath., temp. 5·8°; 1 spec. (♂).

South-West of Iceland: Stat. 81: Lat. 61°44′ N., Long. 27°00′ W., 485 fath., temp. 6·1°; 3 spec. (2 ♂ and 1 larva; one ♂ in *Halichondria tenuiderma* Lundb.)

South of Iceland: Stat. 55: Lat. 63°33′ N., Long. 15°02′ W., 316 fath., temp. 5·9°; 1 spec. (♂).

The "Thor" has gathered a male east of Iceland: Lat. 64°58′ N., Long. 12°40′ W., 70 fath.; the IInd Amdrup Exp. secured a male at Rathbone Island, at ab. Lat. 70°40′ N., Long. 21°30′ W.; the depth must probably have been either 159 or 94 fath.

Distribution. Sars recorded it from two places in West Norway, viz. Hardanger Fjord, 200 fath., and at Hasvig, West Finmark, 150—200 fath. Stebbing's specimen had been taken west of Ireland in Lat. 53°42′ N., 14°11′ W., 208 fath.

162. **Gnathia albescens** n. sp.

(Pl. XVI, figs. 9 a—9 h).

Male (fig. 9 a). Moderately slender, about three and a half times as long as broad. — Head somewhat broader than long, only somewhat narrower than the penultimate pedigerous thoracic segment; the angles at the antennulæ protrude as oblong, short processes, while the major anterior part of the side behind this process is feebly convex, with a broader tubercle anteriorly and behind this a few teeth; the upper surface is deeply and rather broadly excavated in its anterior half to the front margin, which is feebly convex with some small triangular teeth; each half of the surface has from the lateral margin towards the median line and a little in front of the middle a transverse area with a number of small granules. Eyes completely wanting. — Mandibles (fig. 9 b) not very different from those in *G. elongata*; the cutting edge is rather concave, well marked off by a sharp angle from the proximal part of the same margin, which is concave and longer than the cutting edge; the outer upper margin has a protuberance near the middle, and its proximal half is smooth. — Antennulæ (fig. 9 b, a^1) nearly as in *G. elongata*; third peduncular joint shorter than the two proximal joints combined and somewhat shorter than the 5-jointed flagellum. Antennæ (a^2) nearly as in *G. elongata*, with the flagellum 8-jointed. — Maxillipeds (fig. 9 c) normal; the palp 4-jointed, with the terminal joint a little shorter and considerably more narrow than the penultimate joint. — First pair of thoracic legs (fig. 9 d) in the main as in *G. elongata*, but the distal part of the shield-shaped joint has a somewhat long, oblique terminal margin, and at its outer end the usual terminal joint, which is very small, oblong.

The five large thoracic segments do not differ much in breadth (fig. 9 a); fourth segment nearly as long as first and second combined, a little longer than the fifth and without any vestige of a division in the median line, but with a couple of conspicuous impressed points a little from that line and somewhat from the posterior margin; fifth segment with a couple of impressed points near the median line and a little from the posterior margin. The two anterior segments show two or three granules at the lateral margins; otherwise all five segments have the surface smooth, but the more vaulted pair of sublateral areas are marked off at least on the three posterior segments. — The walking legs generally with two oblong protuberances on the lower margin of fifth joint, with a few articulated spines on fourth, fifth and sixth joints together, and some few long pubescent setæ on second and third joints (fig. 9 e).

The abdomen (fig. 9 a) decreases a little in breadth backwards; the five anterior segments without protruding lateral angles. Pleopods without setæ. Last segment (fig. 9 f) about as long as broad, with the lateral margins feeble concave from near the base to the narrowly rounded end. Uropods slightly, or not, overreaching the segment.

Length 2·7—3·2 mm. — The whole surface of the male whitish, with the two pairs of impressed points mentioned somewhat darker.

Larva (figs. 9 g and 9 h). Completely blind; particulars as to the head and its antennulæ and antennæ may be seen on the figure. Last abdominal segment much longer than broad (fig. 9 h), and much overreaching the uropods; the lateral margins are feebly concave, and the end is obtuse, narrowly rounded. — Length 3·7 mm.

Remarks. The male of this small species differs from other northern forms, excepting *G. bicolor*, by having the tergite of the penultimate leg-bearing thoracic segment undivided in the median line; furthermore its complete blindness, the smoothness of the thoracic segments, the shape of the last abdominal segment, and the uniform, whitish colour afford excellent characters. The differences between *G. albescens* and *G. bicolor* are pointed out later on.

Occurrence. Not taken by the "Ingolf", but the "Thor" has captured it at a single place.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 5 spec. (3 ♂, 2 larvæ).

163. Gnathia bicolor n. sp.

(Pl. XVI, figs. 10 a—10 c).

Male. The single specimen is not fully three times as long as broad, but three and a half times as long as the breadth of second leg-bearing thoracic segment, while the posterior segments are broader, and especially the penultimate thoracic segment is considerably widened. — Head almost as long as broad and comparatively small; the angles at the insertion of the antennulæ protrude as small processes, and the sides behind these angles are very convex, even subangular at the middle. Some fine granules are observed on the sides of the head and on a smaller sublateral part of the upper surface; this surface is deeply excavated in the middle of nearly its anterior half; the head is much produced between the mandibles, and the front margin, which is somewhat damaged, seems to have been rather short and considerably emarginate. Eyes wanting. — The mandibles in the main as in *G. albescens*, without teeth on the proximal half of the upper margin, and the protuberance at the end of this half low and feebly developed. Antennulæ and antennæ rather short; the flagella 5-jointed. — Maxillipeds as in *G. albescens*; the shield-shaped first pair of legs as in *G. elongata*.

Penultimate leg-bearing thoracic segment undivided in the middle, laterally considerably widened, only a little shorter than the sum of the two preceding segments. The surface and sides of the thoracic segments are smooth, and even the sublateral areas on the penultimate segment are badly defined. — Thoracic legs (fig. 10 b) a little thicker than in *G. albescens*; fifth joint unarmed or with a single tubercle or, in a couple of legs, with two protuberances on the lower margin; the articulated spines are somewhat long and slender and few in number, while the legs have a good number of long setæ, many of them plumose.

The abdomen decreases conspicuously in breadth backwards; the five anterior segments without protruding lateral angles. Pleopods without setæ. Last segment (fig. 10 c) nearly more than half as long again as broad, with the major distal part moderately narrowed and the end acute; it overreaches somewhat the uropods, which have the rami subequal in breadth.

Length 4·1 mm. — The specimen has the head white, while the remainder of the body is dark olive-greenish, and dark reddish contents of the large central part of the thorax are very visible through the integument.

Remarks. *G. bicolor* is easily separated from the above-described blind *G. albescens* by a number of features, especially by the shape of the head, the last abdominal segment, and the colour.

Occurrence. Taken by the "Ingolf" in the warm area.

South of Iceland: Stat. 40: Lat. 62°00′ N., Long. 21°36′ W., 845 fath., temp. 3·3°; 1 spec. (♂).

164. **Gnathia stygia** G. O. Sars.

1877. *Anceus stygius* G. O. Sars, Archiv. for Math. og Naturv. Vol. II, p. 348.
! 1885. — — G. O. Sars, North-Atl. Exp., Crust. I. p. 85; Pl. 8, figs. 1—22.
1901. *Gnathia stygia* A. Ohlin, Bih. K. Sv. Vet. Akad. Handl. Vol. 26, Afd. IV, No. 12, p. 22, fig. 3.
1901. *Caecognathia stygia* Dollfus, Bull. Soc. Zool. France, 1901, p. 244.
— — *Sarsi* Dollfus, ibid. p. 244, fig. 3.

Dollfus established *C. Sarsi* on a single male taken together with four males of *C. stygia*, but the characters pointed out by him are of no value; all are due to individual variation. Among his characters the best seems to be that in *C. Sarsi* the last abdominal segment terminates "en pointe aigue" and its sides are "nettement dentés", but the males from the "Ingolf" show considerable individual variation in the shape and armature of this segment, as in one specimen it has the rounded end distinctly broader than figured by Sars, while in another specimen the end is very acute, and every intermediate shape is found. Furthermore the sides of the last segment vary from having no lateral denticle to having each one denticle or from two to five or six denticles of various size, and there is, besides, appreciable variation in the breadth of the narrowed part of the segment a little behind the insertion of the uropods.

Female. It has been figured by Ohlin but not described. My single specimen is only about 6·5 mm. long, very thick, blind. Front end of the head slightly produced with the median part of the margin a little convex; each side of the head with a conspicuous subtriangular protuberance. The sides of the two anterior thoracic segments are very distinctly denticulate; the postero-lateral angles of the last pedigerous segment are produced into a distinct, oblong process; the five anterior abdominal segments with the longitudinal row of triangular teeth placed between the upper surface and the side. Last abdominal segment with a minute, protruding lateral denticle a little from the end, and from that denticle the margins converge strongly to the nearly acute end, which has a couple of setæ. — The denticles and processes described afford excellent specific characters for the female sex.

A larval specimen found (by Lütken) on *Liparis frigidus* is 8 mm. long.

Occurrence. This large and fine species has been taken by the "Ingolf at eleven stations, all situated in the cold area.

North of the Færoes: Stat. 141: Lat. 63°22′ N., Long. 6°58′ W., 679 fath., temp. ÷ 0·6°; 6 spec. (5 ♂, 1 ♀).

— - - — Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷ 0·6°; 4 spec. (♂).

East of Iceland: Stat. 105: Lat. 65°34′ N., Long. 7°31′ W., 762 fath., temp. ÷ 0·8°; 1 spec. (♂).

— - — Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷ 0·6°; 1 spec. (♂).

— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷ 0·9°; 5 spec. (1 ♂, 4 larvæ).

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0·5°; 1 spec. (larva).

— - — Stat. 124: Lat. 67°40′ N., Long. 15°40′ W., 495 fath., temp. ÷ 0·6°; 1½ spec. (♂).

North-East of Iceland: Stat. 120: Lat. 67°29′ N., Long. 11°32′ W., 885 fath., temp. ÷ 1·0°; 2 spec. (♂).

— - — Stat. 119: Lat. 67°53′ N., Long. 10°19′ W., 1010 fath., temp. ÷ 1·0°; 1 spec. (larva).

South of Jan Mayen: Stat. 117: Lat. 69°13′ N., Long. 8°23′ W., 1003 fath., temp. ÷ 1·0°; 2 spec. (both larvæ, one of them on *Liparis frigidus*).

— - — — Stat. 113: Lat. 69°31′ N., Long. 7°06′ W., 1309 fath., temp. ÷ 1·0°; 1 spec. (larva, taken on *Liparis frigidus*).

Furthermore recorded by Sars from two stations within our area, viz. east of Iceland: Lat. 65°53′ N., Long. 7°18′ W., 1163 fath., temp. ÷ 1·1°, and between Iceland and Jan Mayen: Lat. 69°02′ N., Long. 11°26′ W., 1004 fath., temp. ÷ 1·1°.

Distribution. G. O. Sars captured *G. stygia* at five other stations, all in the cold area and situated between Lat. 63°17′ N., and Lat. 74°54′ N. in the sea between Norway, Iceland, Jan Mayen and Beeren Eiland; the depths were from 658 to 1215 fath., the temperatures at the bottom from

÷ 1·0° to ÷ 1·4°. Ohlin has recorded it from a place west of Spitzbergen: Lat. 76°36′ N., Long. 12°10′ E., 929 fath., temp. ÷ 1·3°; Dollfus had it from a place in Lat. 79°28′ N., Long. 3°20′ E., 990 fath.

G. stygia is thus only known from the cold area in depths from 293 down to 1309 fath., temp. ÷ 0·5° to ÷ 1·4°. — When Tattersall (Isopoda, 1905) referred with a query a "larval female" taken west of Ireland to this species, because it was blind and similar to Sars' figure of the larva, the determination was certainly wrong; it may also be taken into account that above I have described two new blind species from the warm area.

EXPLANATION OF THE PLATES.[1]

Plate I.

Fig. 1. *Janira maculosa* Leach.

Fig. 1 a. Head of an ovigerous female from about 100 fathoms at the Færoes, from above; × 13. Length of the animal 3·9 mm.

— 1 b. Abdomen of the same female from the Færoes, from above; × 13.

— 1 c. Head of a female with marsupium from the "Ingolf" Stat. 9 (295 fathoms), from above; × 13. Length of the animal 7·4 mm.

— 1 d. Head of a female with marsupium from Lat. 62°11′ N., Long. 19°36′ W., 1010—1140 fath., from above; × 13. Length of the animal 6·5 mm.

— 1 e. Abdomen of the last-named specimen, from above; × 13.

— 1 f. Distal part of the median lamella of the abdominal operculum of a male from Lat. 62°11′ N., Long. 19°36′ W., 1010—1140 fath., from below; × 38.

Fig. 2. *Janira alta* Stimpson.

Fig. 2 a. Anterior part of the body of a female from the "Ingolf" Stat. 96, from above; × 10.

— 2 b. Posterior part of the body of the same female, from above; × 10.

— 2 c. Right lateral and posterior margin of the abdomen shown in fig. 2 b, from above; × 35.

— 2 d. Distal port of the median lamella of the abdominal operculum of a male from the "Ingolf" Stat. 96, from below; × 34.

Fig. 3. *Janira tricornis* Kröyer.

Fig. 3 a. Posterior part of the body of a female without marsupium from Ameralik (near Godthaab), from above; × 10.

— 3 b. Right lateral and posterior margin of the abdomen shown in fig. 3 a, from above; × 35.

Fig. 4. *Janira pulchra* n. sp.

Fig. 4 a. Female with marsupium from the "Ingolf" Stat. 95, from above; × $^{20}/_{3}$.

— 4 b. Left mandible of a female from the "Ingolf" Stat. 95, from below; × 26.

— 4 c. Left maxillula of the same specimen, from below; × 26. *1.* first joint; *2.* second joint; *3.* third joint; *l*¹. lobe from first joint, *l*³. lobe from third joint.

— 4 d. Left maxilla of the same specimen, from below; × 26. *1.* first joint; *2.* second joint; *3.* third joint; *l*². lobe from second joint; *l*³. deeply cleft lobe from third joint.

— 4 e. Left maxilliped of the same specimen, from below; × 26. *a.* the real first joint, the *præcoxa*, which generally seems to have disappeared in the maxillipeds of the order Isopoda, but is easy to point out in the present form.

[1] By a regrettable mistake the plates have been marked III. 4 in the superscription to the left instead of III. 5.

Fig. 4 f. First left thoracic leg of a female; $\times$ 17.
— 4 g. Distal portion of the leg shown in fig. 4 f; $\times$ 52.
— 4 h. Distal part of the median lamella of the operculum in a male, from below; $\times$ 25.

Fig. 5. *Ianira laciniata* G. O. Sars.

Fig. 5 a. Right part of all thoracic segments of a female without marsupium from the "Ingolf" Stat. 32, from above; $\times$ $^{20}/_{3}$. *ep.* epimera, five in all, processes from the first joint of the thoracic legs.

Fig. 6. *Acanthaspidea typhlops* G. O. Sars.

Fig. 6 a. Left maxilliped of a female from Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath., from below; $\times$ 40.
— 6 b. Right part of sixth and seventh thoracic segments of the largest specimen, a male 8·4 mm. long, from above; $\times$ $^{19}/_{2}$. *ep.* epimera, processes from the basal joint of the legs.
— 6 c. Distal part of sixth left thoracic leg of the same large male, from behind; $\times$ 34.
— 6 d. Median lamella of the operculum in the same large male, from below; $\times$ 18.
— 6 e. Distal part of the pleopods shown in fig. 6 d, from below; $\times$ 35.

Fig. 7. *Ianirella spongicola* n. sp.

Fig. 7 a. Major left anterior part of the head with the two proximal joints of left antennula of a female without marsupium, from above; $\times$ 25.
— 7 b. Major part of third thoracic segment of the same female, from above; $\times$ 23.
— 7 c. Abdomen with the lateral parts of seventh thoracic segment of a male, from above; $\times$ 16.

Fig. 8. *Ianirella lævis* n. sp.

Fig. 8 a. Female — 4 mm. long — from the "Ingolf" Stat. 24, from above; $\times$ 13. Legs omitted.
— 8 b. Median frontal part of the head with left antennula of the same female, from above; $\times$ 35.
— 8 c. Left mandible of a female from the "Ingolf" Stat. 36, from below; $\times$ 59.
— 8 d. Left maxilliped of the last-named female, from below; $\times$ 39.
— 8 e. First left thoracic leg of the last-named specimen, from behind; $\times$ 44.
— 8 f. Second left thoracic leg of the last-named specimen, from behind; $\times$ 44.

Fig. 9. *Katianira chelifera* n. gen., n. sp.

Fig. 9 a. Left mandible, from below; $\times$ 100.
— 9 b. Distal part of the same mandible, from below; $\times$ 200.
— 9 c. Left maxilliped, from below; $\times$ 100.
— 9 d. Left lateral plate of the male operculum, from below; $\times$ 90.

Plate II.

Fig. 1. *Katianira chelifera* n. gen., n. sp. (continued).

Fig. 1 a. Male, from above; $\times$ 26. Legs omitted and uropods lost.
— 1 b. Left lateral part of second and third thoracic segments, from above; $\times$ 53.

Fig. 1 c. Head of a female, from above; × 54.
— 1 d. First thoracic leg of a male; × 89.
— 1 e. Distal part of first thoracic leg of a female; × 89.
— 1 f. Second right thoracic leg of a female, from the anterior side; × 89.
— 1 g. Abdomen with right uropod of a female, from above; × 51.
— 1 h. Abdominal operculum of a female, from below; × 40.
— 1 i. Abdomen of a male, from below; × 40. Uropods omitted.

Fig. 2. *Haploniscus bicuspis* G. O. Sars.

Fig. 2 a. Male from the "Ingolf" Stat. 117, from above; × 15. Legs omitted.
— 2 b. Left antennula, first joint of right antennula and the whole right antenna of a male from the the same station, from above; × 35.
— 2 c. Second, third and fourth joints of left antenna of a male from the same station, from the outer side; × 50.
— 2 d. Right antennula and antenna of a female from the same station, from above; × 35.
— 2 e. Left maxilliped of a male from the same station, from below; × 60.
— 2 f. Distal part of third right leg of a male from the same station, from behind; × 200.
— 2 g. Posterior end of abdomen of the male shown in fig. 2 a, from above; × 30. *u*. uropods.
— 2 h. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a male from the "Ingolf" Stat. 117, from below; × 34. *a*. anal doors; *c*. the very long and setiform male appendix of left lateral opercular plate; *u*. uropod.
— 2 i. Median lamella of the abdominal operculum of a male from the same station, from below; × 44.
— 2 k. Posterior end of abdomen of a female from the same station, from above; × 34.
— 2 l. Abdomen of another female from the same station, from below; × 34.

Fig. 3. *Haploniscus spinifer* n. sp.

Fig. 3 a. Frontal margin of the head with right antennula and antenna, and the proximal parts of left antennula and antenna, of a male from the "Ingolf" Stat. 22, from above; × 23.
— 3 b. First joint of the flagellum, and terminal part of the peduncle with the characteristic spiniform upper process of left antenna of a male, from above; × 20.
— 3 c. Second, third and fourth joints of left antenna of a male from the "Ingolf" Stat. 22, from the outer side; × 50.
— 3 d. Posterior end of abdomen of a male from the same station, from above; × 23. *u*. uropods.
— 3 e. Posterior end of abdomen of another male from the same station, from above; × 23.
— 3 f. Median plates of the abdominal operculum of a male from the same station, from below; × 48.
— 3 g. Right lateral plate of the abdominal operculum of the last-named male, from above; × 48.
— 3 h. Abdomen of a female without marsupium from the "Ingolf" Stat. 36, from below; × 23. *a*. anal doors; *o*. operculum; *u*. uropods.

Fig. 4. *Haploniscus armadilloides* n. sp.

Fig. 4 a. Body of a female without marsupium, from above; × 27.

— 4 b. Head with antennulæ and antennæ of the same specimen, from below; × 55. The mouthparts omitted.

— 4 c. Distal part of fifth left leg, from behind; × 136.

— 4 d. Abdomen of the same specimen, from below; × 48. *a.* anal doors; *o.* operculum; *u.* uropods.

— 4 e. Posterior part of abdomen with uropods and anal doors of the same specimen, from below; × 70.

Fig. 5. *Hydroniscus abyssi* n. gen., n. sp.

Fig. 5 a. Female without marsupium, from above; × 16.

— 5 b. Another female, from the left side; × 16. Four legs omitted.

— 5 c. Anterior part of the head of a female, from below; × 35. Left antennula and antenna omitted.

— 5 d. Left mandible of a female, from below; × 64. Major part of the palp omitted.

— 5 e. Distal half of the same mandible, from below; × 134.

— 5 f. Left maxilliped of the same female, from below; × 64.

— 5 g. Major part of first left thoracic leg of a female, from behind; × 57.

— 5 h. Distal part of the leg shown in fig. 5 g, from behind; × 140.

— 5 i. Distal part of seventh left leg, from in front; × 140.

— 5 k. Abdomen and the two posterior thoracic segments with the proximal parts of their legs of a female without marsupium, from below; × 27. *a.* anal doors; *o.* operculum; *p.* process from the lower margin of the abdomen.

Plate III.

Fig. 1. *Munna Boeckii* Kröyer.

Fig. 1 a. Median lamella of the abdominal operculum of a male from the Færoes — northern end of Naalsø —, from below; × 48.

— 1 b. Distal parts of the pleopods shown in fig. 1 a, from below and more highly magnified.

Fig. 2. *Munna groenlandica* n. sp.

Fig. 2 a. Left part of the head with eye, antennula and proximal part of the antenna of an ovigerous female from Egedesminde, from above; × 27.

— 2 b. Abdomen of the same female, from above; × 27.

— 2 c. Median lamella of the abdominal operculum of a male from Danmark-Ø (East Greenland), from below; × 48.

— 2 d. Distal parts of the pleopods shown in fig. 2 c, from below and more highly magnified.

Fig. 3. *Munna Hanseni* Stappers.

Fig. 3 a. Anterior part of the body of a female from the "Ingolf" Stat. 44, from above; × 23.

— 3 b. The two posterior thoracic segments and the abdomen of the same female, from above; × 23.

Fig. 3 c. Right portion of the head and of first thoracic segment of a subadult female from the "Ingolf" Stat. 44, from above; × 33.

— 3 d. Head and major part of first thoracic segment of a male from the "Ingolf" Stat. 81, from above; × 33.

— 3 e. Right portion of the head of a male from the "Ingolf" Stat. 44, from above; × 23.

— 3 f. Major part of first left leg of a male, from behind; × 35.

— 3 g. Median lamella of the abdominal operculum of a male from the "Ingolf" Stat. 44, from below; × 45.

— 3 h. Distal parts of the pleopods shown in fig. 3 g, from below and more highly magnified.

Fig. 4. *Munna Kröyeri* Goodsir.

Fig. 4 a. Median lamella of the abdominal operculum of a male from Norway, from below; × 80.

— 4 b. Distal parts of the pleopods shown in fig. 4 a, from below and more highly magnified.

Fig. 5. *Munna Fabricii* Kröyer.

Fig. 5 a. Right uropod of a male from Godthaab (West Greenland), from below; × 168.

— 5 b. Left uropod of another male from the same locality, from above; × 168.

— 5 c. Median lamella of the abdominal operculum of a male from Godthaab, from below; × 55.

— 5 d. Distal parts of the pleopods shown in fig. 5 c, more highly magnified.

Fig. 6. *Munna minuta* H. J. H.

Fig. 6 a. Median plates of the abdominal operculum of a male from Davis Strait, Lat. 64°52′ N., from below; × 80.

Fig. 7. *Munna acanthifera* n. sp.

Fig. 7 a. Anterior part of the body of a female without marsupium from the "Ingolf" Stat. 35, from above; × 22.

— 7 b. Posterior part of the body of the same female, from above; × 22.

— 7 c. Anterior margin of the head of another female from the same station, from above; × 44.

— 7 d. Posterior part of the body of another female without marsupium from the same station, from the left side; × 24.

— 7 e. Anterior part of the body of a male from the same station, from above; × 22. Right antennula, excepting its basal joint, and right antenna omitted.

— 7 f. Antennula of a male from the same station, from above; × 45.

— 7 g. Median lamella of the abdominal operculum of a male from the same station, from below; × 45.

— 7 h. Distal parts of the pleopods shown in fig. 7 g, more highly magnified.

Fig. 8. *Pleurogonium inerme* G. O. Sars.

Fig. 8 a. Left portion of all thoracic segments of a not quite full-grown female from Jan Mayen, from above; × 27.

— 8 b. First right thoracic leg of a male from Jan Mayen, from behind; × 91.

Fig. 9. *Pleurogonium latimanum* n. sp.

Fig. 9 a. The single male specimen, from above; × 40.
— 9 b. Left antennula, from above; × 80.
— 9 c. First right leg, from the outer side; × 136.
— 9 d. Left uropod, from above; × 200.

Fig. 10. *Pleurogonium intermedium* n. sp.

Fig. 10 a. Left half of the thoracic segments of an adult female from the "Ingolf" Stat. 138, from above; × 50.
— 10 b. Left half of the thoracic segments of a male from the same station, from above; × 50.
— 10 c. First right leg of a male from the same station, from behind; × 91.
— 10 d. Abdomen of a female from the same place, from above; × 37.

Fig. 11. *Pleurogonium rubicundum* G. O. Sars.

Fig. 11 a. Left half of the thoracic segments of an adult female from Klaksvig (the Færoes), from above; × 27.
— 11 b. Abdomen and seventh thoracic segment of an adult female, from above; × 44.

Fig. 12. *Pleurogonium pulchrum* n. sp.

Fig. 12 a. The single female without marsupium, from above; × 38. Most of the dorsal median processes either mutilated or their distal part omitted.
— 12 b. Head and first thoracic segment, from above; × 58. Major part of the median dorsal process omitted.
— 12 c. Right parts of third and fourth thoracic segments, from above; × 51.
— 12 d. Major part of first leg; × 134.
— 12 e. Abdomen and last thoracic segment, from above; × 61.

Plate IV.

Fig. 1. *Pseudomunna hystrix* n. gen., n. sp.

Fig. 1 a. Head and first thoracic segment of a female without marsupium, from above; × 24.
— 1 b. Right antennula of a male, from above; × 32.
— 1 c. Left mandible of a male, from below; × 55.
— 1 d. Left maxilliped of a male, from below; × 55.
— 1 e. Left thoracic leg of a female, from in front; × 34.
— 1 f. Abdomen of a female, from above; × 24. The uropods and some of the dorsal spines lost.
— 1 g. Abdominal operculum of a female, from below; × 23.
— 1 h. Abdomen of a male, from below; × 26. The uropods were lost.
— 1 i. Distal part of the median lamella of the male abdominal operculum, from below; × 54.

Fig. 2. *Dendrotion spinosum* G. O. Sars.

Fig. 2 a. Head and first thoracic segment of a female with marsupium from Lat. 58°32′ N., from above;

× 26. *ep.* epimeron. Of right antennula and antenna the proximal joints, of left antennula and antenna only the basal patt of their first joint are shown.

Fig. 2 b. Left portion with epimeron of first thoracic segment shown in fig. 2 a, from above; × 50. The seta terminating the process was lost.

— 2 c. The three posterior thoracic segments, with the proximal parts of the legs and of the abdomen, of a female without marsupium from Lat. 61°15′ N., from above; × 23.

Fig. 3. *Dendrotion paradoxum* n. sp.

Fig. 3 a. Not full-grown male, from above; × 23. Of the antennulæ and antennæ only the proximal joints are shown.

— 3 b. Right process of third segment of the same male, from above; × 90.

— 3 c. Head with right antennula and antenna of an immature female, from above; × 32.

— 3 d. Distal half of first left leg of the largest male, from behind; × 88.

— 3 e. End of abdomen of a male, from above; × 130.

Fig. 4. *Schistosoma ramosum* n. gen., n. sp.

Fig. 4 a. The single specimen, a male, from above; × 40.

— 4 b. Posterior segments of the thorax and basal part of abdomen, from above; × 53.

— 4 c. Right antennula, from above; × 93.

— 4 d. Left mandible, from below; × 127.

— 4 e. Left maxilliped, from below; × 127.

— 4 f. Major part of first left leg, from behind; × 93.

— 4 g. Distal part of the same leg, from behind; × 145.

— 4 h. Distal part of sixth left leg, from behind; × 127.

— 4 i. Last thoracic segment and abdomen, from below; × 80.

Fig. 5. *Ischnomesus profundus* n. sp.

Fig. 5 a. The single specimen, a male, from above; × $^{23}/_{2}$. Uropods lost.

— 5 b. Head and the two anterior thoracic segments, from above; × 24.

— 5 c. Right maxilliped, from below; × 77.

— 5 d. Major part of first left leg, from behind; ab. × 35.

— 5 e. Posterior part of the body, from above; × 25. The uropods lost.

— 5 f. Abdomen and seventh thoracic segment with the proximal part of left leg, from below; × 30. The uropods lost.

Fig. 6. *Ischnomesus armatus* n. sp.

Fig. 6 a. Male, from above; × 11.

— 6 b. Head with the two anterior thoracic segments of the same male, from above; × 24.

— 6 c. Left mandible, from below; × 64.

— 6 d. Right maxilliped of a male, from below; × 64.

Fig. 6 e. First left leg of a male, from in front; × 34.
— 6 f. Abdomen and seventh thoracic segment with the basal parts of its legs, from below; × 30. The anal doors wanting.

Plate V.

Fig. 1. *Haplomesus quadrispinosus* G. O. Sars.

Fig. 1 a. Large male from the "Ingolf" Stat. 36, from above; × $^{21}/_2$.
— 1 b. Three anterior segments with the head of the male shown in fig. 1 a, from above; × 23.
— 1 c. Anterior third of the body of a male from the "Ingolf" Stat. 38, from above; × 16. Of the antennulæ only the basal joint and of the antennæ the proximal parts are shown.
— 1 d. Anterior third of the body of a scarcely full-grown male from the "Ingolf" Stat. 36, from the right side. The entire first leg, the first and most of the second joint of the antennula, the three proximal joints of the antenna, the first joint of second and fourth legs, and first and most of second joint of third leg are shown.
— 1 e. Left mandible of a male, from below; × 83.
— 1 f. Right maxilliped of the same male, from below; × 83.
— 1 g. First left leg of a male, from behind; × 58.
— 1 h. Abdomen and the two posterior thoracic segments of a male from the "Ingolf" Stat. 36, from above; × 23.
— 1 i. Abdomen and the two posterior thoracic segments of another male from the same station, from below; × 31.
— 1 k. Median lamella of the abdominal operculum of a male from the same station, from below; × 60. The lateral glabrous parts of the pleopods are in situ overlapped by the lateral plates.
— 1 l. Left lateral plate of the abdominal operculum of the last-named male, from below; × 60. The granulation omitted.
— 1 m. Female with the marsupium rudimentary, from the "Ingolf" Stat. 24, from above; × $^{21}/_2$.
— 1 n. Anterior part of the body of the female shown in fig. 1 m, from above; × 24. Left antenna omitted.
— 1 o. Abdomen and the two posterior thoracic segments of the female shown in fig. 1 m, from above; × 24.
— 1 p. Abdomen and last thoracic segment of another female from the same station, from below; × 28.

Fig. 2. *Haplomesus angustus* n. sp.

Fig. 2 a. Male from the "Ingolf" Stat. 18, from above; × 11. The specimen is certainly far from adult, as seventh thoracic segment is very small and without legs.
— 2 b. Head and the two anterior thoracic segments of the male shown in fig. 2 a, from above; × 28.
— 2 c. First right leg of the same male, from behind; × 47.
— 2 d. Abdomen and the two posterior thoracic segments of the same male, from above; × 17.

Fig. 2 e. Abdomen and the two posterior thoracic segments of the same male, from below; × 24. *6*. basal joint of sixth thoracic leg. As already stated, the seventh pair of legs are not developed.

Fig. 3. *Haplomesus insignis* n. sp.

Fig. 3 a. The single male, from above; scarcely × 10.
— 3 b. Head and the two anterior thoracic segments, from above; × 26.
— 3 c. First left leg, from behind; × 50.
— 3 d. Abdomen and seventh thoracic segment, from below; × 34.

Fig. 4. *Haplomesus tenuispinis* n. sp.

Fig. 4 a. Anterior part of the body of a female without marsupium from the "Ingolf" Stat. 24, from above; × 25.
— 4 b. Right antennula of the same specimen, from above; × 46.
— 4 c. First left leg of the same specimen, from behind; × 49.
— 4 d. The body, excepting the two anterior thoracic segments and the head, of a mutilated juvenile female from the "Ingolf" Stat. 22, from above; × 17.
— 4 e. Posterior part of the body of the last-named specimen, from above; × 42. *7*. seventh thoracic segment; *d*. denticles.
— 4 f. The two posterior thoracic segments and the abdomen of the last-named specimen, from below; × 42. *7*. base of seventh thoracic leg.

Fig. 5. *Haplomesus modestus* n. sp.

Fig. 5 a. Body of the single mutilated specimen without first thoracic segment and head, from above; × 24.
— 5 b. The three posterior segments and abdomen of the same specimen, from below; × 44.

Fig. 6. *Heteromesus dentatus* n. sp.

Fig. 6 a. Mutilated male without first thoracic segment and head, from above; × 14.
— 6 b. Anterior part of the body of a mutilated female with the marsupium rudimentary, from above; × 17.
— 6 c. Right antennula of the last-named female, from above; × 46.
— 6 d. First left leg of a young specimen, from behind; × 63.

Plate VI.

Fig. 1. *Heteromesus dentatus* n. sp. (continued).

Fig. 1 a. Abdomen and the two posterior thoracic segments of a male, from above; × 23.
— 1 b. Abdomen and seventh thoracic segment of another male, from below; × 28.
— 1 c. Abdominal operculum of a young female, from below; × 50.

Fig. 2. *Heteromesus longiremis* n. sp.

Fig. 2 a. Body of a mutilated female without first thoracic segment and head, from above; × 13.
— 2 b. Last thoracic segment and abdomen of the female, from above; × 22.

Fig. 2 c. Last thoracic segment and abdomen of the female, from below; × 22.
— 2 d. Three posterior thoracic segments and abdomen of a mutilated male, from above; × 10.
— 2 e. Abdomen and posterior part of the thorax of the same male, from above; × 20.
— 2 f. Abdomen and last thoracic segment of the same male, from below; × 20.

Fig. 3. *Heteromesus Schmidtii* n. sp.

Fig. 3 a. The single female without marsupium, from above; × 10.
— 3 b. The three anterior thoracic segments and the head, from above; × 15. The wavy markings mentioned in the text omitted.
— 3 c. Terminal part of left antennula, from above; about × 300. *s.* proximal part of the very long distal seta on second joint.
— 3 d. Abdomen and seventh thoracic segment, from above; × 19.
— 3 e. Abdomen and seventh thoracic segment, from below; × 19.

Fig. 4. *Heteromesus frigidus* n. sp.

Fig. 4 a. Adult male from the "Ingolf" Stat. 139, from above; × 11.
— 4 b. Anterior part of the body of the same male, from above; × 16.
— 4 c. Terminal part of right antennula of a male, from above; about × 300. *2.* distal part of second joint; *3.* third joint; *4.* fourth joint; *s.* proximal part of the strong distal seta.
— 4 d. Last thoracic segment and abdomen of a male from the "Ingolf" Stat. 139, from above; × 24.
— 4 e. Last thoracic segment and abdomen shown in fig. 4 d, from below; × 24. The granulation omitted.
— 4 f. Median plates of the abdominal operculum of a male from the same station, from below; × 45.
— 4 g. Left lateral plate of the abdominal operculum of the last-named male, from below; × 54.
— 4 h. Adult female from the "Ingolf" Stat. 139, from above; × 11. The marsupium omitted.
— 4 i. Head and the three anterior thoracic segments of the female shown in fig. h, from above; × 16.
— 4 k. Right antennula of a female, from the left side; × 47. The major part of the distal seta omitted.
— 4 l. Distal part of another antennula, obliquely from the outer side and from above; about × 300. *2.* distal part of second joint; *3.* third joint; *4.* fourth extremely short joint — the distal part of its long seta omitted; *s.* proximal part of the very thick distal seta.
— 4 m. Left mandible of a female, from below; × 56.
— 4 n. Distal part of the same mandible, from below; × 165.
— 4 o. Right maxilliped of another female, from below; × 56.
— 4 p. First left leg of a female, from behind; × 47.
— 4 q. Distal oblique margin with setæ and comb of the leg shown in fig. 4 p, from the outer side; × 172.
— 4 r. Abdomen and seventh thoracic segment of a female, from above; × 24.
— 4 s. Abdomen and seventh thoracic segment of a female, from below; × 24.
— 4 t. Operculum of a female, from below; × 34.

Fig. 5. *Pseudomesus brevicornis* n. gen., n. sp.

Fig. 5 a. Adult female, from the right side; × 21. Marsupium omitted and the antenna lost excepting its short proximal joints.

— 5 b. Body of another adult female, from above; × 16.

— 5 c. Right antennula, from the outer side; × 68.

— 5 d. Both mandibles, from below; × 68.

— 5 e. Left maxilliped, from below; × 68.

— 5 f. First right leg, from the outer side; × 48. *a*. the two distal spines of fifth joint and the margin between them, more highly magnified.

— 5 g. Abdomen and posterior part of last thoracic segment of the female shown in fig. 5 b, from below; × 32.

Fig. 6. *Macrostylis spinifera* G. O. Sars.

Fig. 6 a. Abdomen and the posterior part of last thoracic segment of a male from Skager Rak ("Hauch" Stat. 460), from below; × 52.

— 6 b. Abdomen and the posterior part of last thoracic segment of a female from the same Danish locality, from below; × 52.

— 6 c. Left postero-lateral subdiaphanous portion of the abdomen of a female, seen from above and exhibiting the peculiar statocyst consisting of an internal cavity containing a lump of minute crystals; about × 150.

Plate VII.

Fig. 1. *Macrostylis spinifera* G. O. Sars (continued).

Fig. 1 a. Head with antennulæ and the right antenna of a female from the "Ingolf" Stat. 80, from above; × 42.

— 1 b. Leg of third pair of the same specimen; × 54.

— 1 c. Posterior part of the body with sixth right leg and left uropod of the same specimen, from above; × 30.

Fig. 2. *Macrostylis abyssicola* n. sp.

Fig. 2 a. Female from the "Ingolf" Stat. 37, from above; × 15.

— 2 b. Left margin of the head with antennula and antenna of a female from the "Ingolf" Stat. 37, from above; × 57. *s*. sensory filament.

— 2 c. Male from the "Ingolf" Stat. 22, from above; × 15.

— 2 d. Left margin of the head with antennula and antenna of the last-named male, from above; × 57. *s*. sensory filaments.

— 2 e. Third left leg of a female; × 45.

— 2 f. Sixth left leg of a female, from in front; × 45.

— 2 g. Abdomen and the two posterior segments of a female from the "Ingolf" Stat. 38, from below; × 27.

— 2 h. Abdomen and the two posterior thoracic segments of a male from the "Ingolf" Stat. 22, from below; × 35.

Fig. 3. *Macrostylis elongata* n. sp.

Fig. 3 a. The single female (without marsupium), from above; × 17. The left uropod was almost completely preserved.
— 3 b. Head, from above; × 48. Most of the left antennula omitted. *s.* sensory filament.
— 3 c. Third left leg, from behind; × 50.
— 3 d. Sixth left leg, from in front; × 50.
— 3 e. Seventh left leg, from in front; × 50.
— 3 f. Posterior part of the body — most of the uropods omitted — from above; × 35.
— 3 g. Abdomen and the posterior part of the preceding segment, from below; × 40.

Fig. 4. *Macrostylis subinermis* n. sp.

Fig. 4 a. Female without marsupium from the "Ingolf" Stat. 102, from above; × 14.
— 4 b. Left part of the head with antennula and antenna of a female from the "Ingolf" Stat. 139, from above; × 45.
— 4 c. Left maxilliped, from below; × 60.
— 4 d. Third left thoracic leg of a female, from the "Ingolf" Stat. 119, from behind; × 32.
— 4 e. Sixth left thoracic leg of the last-named specimen, from in front; × 32.
— 4 f. Posterior part of the body of a female from the "Ingolf" Stat. 139, from above; × 22.
— 4 g. Abdomen and the two posterior thoracic segments of a female from the "Ingolf" Stat. 102, from below; × 24.
— 4 h. Posterior part of the body of a young specimen, with seventh pair of legs only half developed, from Lat. 66°19′ N., Long. 10°45′ W., from above; × 40.

Fig. 5. *Macrostylis longiremis* Meinert.

Fig. 5 a. Abdominal operculum of a female taken by the "Thor", from below; × 36.

Fig. 6. *Macrostylis longipes* n. sp.

Fig. 6 a. The single specimen, a male, from the left side; × 15. The antennæ, excepting the short proximal joints, and the uropods were lost.
— 6 b. Left antennula, from the outer side; × 38.
— 6 c. Third left leg, from the outer side; × 25.
— 6 d. Sixth left leg, from the outer side; × 25.
— 6 e. Seventh left leg, from the outer side; × 25.
— 6 f. The two posterior thoracic segments and the abdomen, from above; × 25. Uropods lost.
— 6 g. Abdomen and last thoracic segment, from below; × 25.

Fig. 7. *Nannoniscella groenlandica* n. gen., n. sp.

Fig. 7 a. Left mandible of the single female, from below; × 87.
— 7 b. Left maxillula, from below; × 87.
— 7 c. Left maxilla, from below; × 87.
— 7 d. Left maxilliped, from below; × 87.

Pl. VIII.

Fig. 1. *Nannoniscella groenlandica* n. gen., n. sp. (continued).

Fig. 1 a. Female, from above; × 23.

— 1 b. Right part of the head with antennula and proximal part of antenna, and, besides, right part of first thoracic segment with "epimeron", *ep.*, viz. a process from first joint of the leg, of the same female, from above; × 56.

— 1 d. First left thoracic leg of the same female, from below; × 58.

— 1 e. Sixth left leg of the same female, from in front; × 58.

— 1 f. Major part of abdomen of the same female, from below; × 46.

Fig. 2. *Nannoniscoides angulatus* n. gen., n. sp.

Fig. 2 a. Male, from above; × 24.

— 2 b. Head of the male, from above; × 46.

— 2 c. Major part of right mandible, from below; × 93.

— 2 d. Abdomen and the two posterior segments, with the proximal parts of their legs, from below; × 39.

— 2 e. Left maxilliped, from below; × 93.

Fig. 3. *Nannoniscus simplex* n. sp.

Fig. 3 a. Male, from above; × 21.

— 3 b. Head and anterior thoracic segments of a male, from above; × 33.

— 3 c. Head of a female, from above; × 33.

— 3 d. Left portion of the head of a male, with antennula and the four proximal joints of the antenna, from above; × 88.

— 3 e. First left thoracic leg of a female, from behind; × 44.

— 3 f. Seventh left thoracic leg of a female, from in front; × 44.

— 3 g. Distal part of first left thoracic leg of a male, from behind; × 44.

— 3 h. Seventh left thoracic leg of a male, from in front; 44.

— 3 i. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a male, from below; × 43.

— 3 k. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a female, from below; × 35.

— 3 l. Abdomen and three thoracic segments of a female, from the left side; × 42. Of seventh thoracic leg only the base, of sixth and fifth legs the proximal portion is drawn.

Fig. 4. *Nannoniscus oblongus* G. O. Sars.

Fig. 4 a. Anterior half of a female, from above; × 32.

— 4 b. Anterior part of the head of a male, with right antennula and the four proximal joints of right antenna, from above; × 56.

— 4 c. Anterior left portion of the head of a female, with antennula, the four proximal joints of the antenna, and the concave anterior margin of the front area, from above; × 36.

Fig. 4 d. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a male, from below; × 53.

— 4 e. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a female, from below; × 37.

— 4 f. Proximal portion of left antenna of a female from Norway, from above; × 84. The figure shows the extreme length of the exopod, which is not marked off by any suture.

Fig. 5. *Nannoniscus arcticus* n. sp.

Fig. 5 a. Anterior half of a female, from above; × 24.

— 5 b. Anterior right part of the head of a female, with antennula and proximal part of antenna, from above; × 76.

— 5 c. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of a female, from below; × 32.

— 5 d. Right uropod of the same female, from below; × 82.

Fig. 6. *Nannoniscus analis* n. sp.

Fig. 6 a. Female, from above; × 20.

— 6 b. Anterior half of a male, from above; × 27.

— 6 c. Right antennula of a male, from above; × 100.

— 6 d. Right antenna of a male, from the outer side; × 42.

— 6 e. First left thoracic leg of a male, from behind; × 48.

— 6 f. Third left thoracic leg of a male, from behind; × 48.

— 6 g. Distal part of the leg shown in fig. 6 f, from behind; × 92.

— 6 h. Abdomen and last thoracic segment, with the proximal parts of its legs, of a male, from below; × 41.

— 6 i. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a female, from below; × 41.

— 6 k. Abdomen and the three posterior thoracic segments of a female, from the left side; × 33. The legs omitted excepting the coxæ of the sixth and seventh legs.

Plate IX.

Fig. 1. *Nannoniscus analis* n. sp. (continued).

Fig. 1 a. Seventh left thoracic leg of a male, from in front; × 48.

— 1 b. Seventh left thoracic leg of a female, from in front; × 58.

Fig. 2. *Nannoniscus reticulatus* n. sp.

Fig. 2 a. Male, from above; × 27. The reticulation omitted.

— 2 b. Anterior part of the head of a male, from above; × 40.

— 2 c. Female, from above; × 32.

— 2 d. Right antennula of a female, from above; × 110.

— 2 e. First left thoracic leg of a female, from behind; × 51.

Fig. 2 f. Seventh left thoracic leg of a female, from in front; × 51.
— 2 g. Distal part of the leg shown in fig. 2 f, from in front; × 100.
— 2 h. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a female, from below; × 50.
— 2 i. Abdomen and the three posterior thoracic segments, with the proximal parts of their legs, of a female, from the left side; × 36.
— 2 k. Abdomen and the three posterior thoracic segments, with the basal parts of their legs, of a male, from the left side; × 45.
— 2 l. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of another female, from below; × 43.

Fig. 3. *Nannoniscus laticeps* n. sp.

Fig. 3 a. Young female, from above; × 28.
— 3 b. Anterior half of the same female, from above; × 45.
— 3 c. Anterior left part of the head, with antennula and the four proximal joints of the antenna, of the same female, from above; × 135.
— 3 d. Abdomen and posterior portion of thorax, with the basal parts of two pairs of legs, of the same female, from below; × 63.

Fig. 4. *Nannoniscus inermis* n. sp.

Fig. 4 a. Outline of the anterior part of the head of a female, from above; × 31.
— 4 b. Anterior left part of the head with antennula and the four proximal joints of the antenna of a female, from above; × 82.
— 4 c. First left thoracic leg of a female, from behind; × 44.
— 4 d. Second left thoracic leg of a female, from behind; × 44.
— 4 e. Seventh left thoracic leg of a female, from in front; × 44.
— 4 f. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of a female, from below; × 31.

Fig. 5. *Nannoniscus æquiremis* n. sp.

Fig. 5 a. Anterior half of an ovigerous female, from above; × 32.
— 5 b. Left antennula of a female, from above; × 128.
— 5 c. First left thoracic leg of a female, from behind; × 55.
— 5 d. Seventh right thoracic leg of a female, from in front; × 55.
— 5 e. Distal part of the leg shown in fig. 5 d, from in front; × 130.
— 5 f. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of an ovigerous female, from below; × 44.
— 5 g. Same parts as shown in fig. 5 f, from the right side; × 46.
— 5 h. Right uropod, from below; × 112.

Fig. 6. *Nannoniscus plebejus* n. sp.

Fig. 6 a. Major part of a male, from above; × 50.
— 6 b. Anterior part of a female, from above; × 50. Of left antenna the sixth joint of the peduncle and the filiform flagellum are omitted.
— 6 c. Anterior right part of the head of a male, showing the antennula and the four proximal joints of the antenna, from above; × 145.
— 6 d. First right thoracic leg of a male, from behind; × 82.
— 6 e. Seventh left leg of a male, from behind; × 82.
— 6 f. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a female, from below; × 67.
— 6 g. Abdomen and the two posterior thoracic segments, with the proximal parts of their legs, of a male, from below; × 86.

Fig. 7. *Nannoniscus minutus* n. sp.

Fig. 7 a. Female without marsupium, from above; × 31.
— 7 b. Anterior half of the same female, from above; × 50.
— 7 c. Right antennula of a female, from above; × 180.
— 7 d. First left thoracic leg of a female, from behind; × 78.
— 7 e. Sixth left thoracic leg of the same female, from in front; × 78.
— 7 f. Abdomen and last thoracic segment of a female, from above; × 47.
— 7 g. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of an ovigerous female, from below; × 61.
— 7 h. Abdomen and the three posterior thoracic segments, with the proximal parts of their legs, of the same female, from the left side; × 58.

Plate X.

Fig. 1. *Nannoniscus armatus* n. sp.

Fig. 1 a. Young female, from above; × 27.
— 1 b. Head of the same specimen, from above; × 45.
— 1 c. First left thoracic leg of the same specimen, from hehind; × 56.
— 1 d. Second left thoracic leg, from behind; × 59.
— 1 e. Abdomen and the three posterior thoracic segments of the same young female, from the right side; × 46. Seventh leg omitted as only half developed, the proximal parts of the two preceding legs are shown.
— 1 f. Abdomen and the posterior part of the thorax of the same specimen, from below; × 58. The only half-developed seventh pair of the thoracic legs omitted, while the proximal parts of sixth pair are shown. The long and slender ventral process shown on fig. 1 e has not been rendered, as the anterior half of the penultimate thoracic segment is omitted.

Fig. 2. *Nannoniscus spinicornis* n. sp.

Fig. 2 a. Anterior half of a female, from above; × 53.
— 2 b. Right antennula, from above; × 152.

Fig. 2 c. Left antennula, excepting its first joint, obliquely from the outer side; × 152.
— 2 d. Major part of seventh left leg of a female, from in front; × 82.
— 2 e. Abdomen and last thoracic segment of a female, from above; × 52.
— 2 f. Sketch of abdomen and posterior part of thorax, with the basal parts of the two posterior legs, of a female, from the left side; × 50.
— 2 g. Abdomen and the two posterior thoracic segments, with the basal parts of their legs, of a female, from below; × 73.

Fig. 3. *Nannoniscus affinis* n. sp.

Fig. 3 a. Front margin of the head of the largest specimen, from above; × 64.
— 3 b. Seventh left thoracic leg of a female, from in front; × 82.
— 3 c. Abdomen and last thoracic segment, with the basal part of its legs, of a female, from below; × 88.

Fig. 4. *Desmosoma globiceps* Meinert.

Fig. 4 a. Head and three thoracic segments of a female with marsupium from Klaksvig, from above; × 30.
— 4 b. Second right thoracic leg of an adult female from Klaksvig, from the outer side; × 70.

Fig. 5. *Desmosoma latipes* n. sp.

Fig. 5 a. The five anterior thoracic segments of a small female, from above; × 33.
— 5 b. First right thoracic leg of a female without marsupium, from the outer side; × 54.
— 5 c. Second right thoracic leg of the last-named female, from the outer side; × 54.
— 5 d. The three distal joints of the leg shown in fig. 5 c, from the outer side; × 84.
— 5 e. Abdomen of a small female, from above; × 50.
— 5 f. Posterior part of the abdomen shown in fig. 5 e, from below; × 77.

Fig. 6. *Desmosoma longispinum* n. sp.

Fig. 6 a. Female without marsupium, from above; × 27.
— 6 b. First left thoracic leg of a female, from behind; × 57.
— 6 c. Second left thoracic leg with "epimeron" of the same female, from behind; × 57.
— 6 d. Seventh right thoracic leg of the same female, from in front; × 57.
— 6 e. Male, from above; × 33.
— 6 f. Antennula of the male, from above; about × 100.
— 6 g. First right thoracic leg of a male, from behind; × 57.
— 6 h. Abdomen with uropod of a male, from the right side; × 57.
— 6 i. Abdomen and posterior end of thorax, with the basal parts of last pair of legs, of a male, from below; × 54.

Fig. 7. *Desmosoma simile* n. sp.

Fig. 7 a. Ovigerous female, from above; × 25.
— 7 b. First left thoracic leg of an ovigerous female, from behind; × 52.
— 7 c. Second left leg of the same female, from behind; × 52.

Fig. 7 d. Seventh left leg of the same female, from in front; × 52.
— 7 e. Posterior part of abdomen with uropods of the same female, from below; × 55.

Fig. 8. *Desmosoma politum* n. sp.

Fig. 8 a. Female without marsupium, from above; × 26.
— 8 b. First left thoracic leg of a female, from behind; × 55.
— 8 c. Second left thoracic leg of the same female, from behind; × 55.
— 8 d. Seventh left thoracic leg of the same female, from in front; × 55.
— 8 e. Abdomen of a female, from below; × 54.

Plate XI.

Fig. 1. *Desmosoma gracilipes* n. sp.

Fig. 1 a. Ovigerous female, from above; × 18.
— 1 b. First left thoracic leg of a female, from behind; × 34.
— 1 c. Second left thoracic leg of the same female, from behind; × 34.
— 1 d. Seventh left thoracic leg of the same female, from in front; × 34.
— 1 e. Posterior part of abdomen with uropods of a subadult female, from below; × 45.
— 1 f. Male, from above; × 21.

Fig. 2. *Desmosoma natator* n. sp.

Fig. 2 a. Male, from above; × 33.
— 2 b. First right thoracic leg of the male, from behind; × 63.
— 2 c. Major part of second right thoracic leg of the male, from behind; × 63.
— 2 d. Seventh left thoracic leg of the male, from in front; × 63.
— 2 e. Abdomen and posterior part of thorax, with the basal parts of last pair of legs, of the same male, from below; × 54.

Fig. 3. *Desmosoma laterale* G. O. Sars.

Fig. 3 a. Female without marsupium, from above; × 27.
— 3 b. Head and the two anterior thoracic segments of a female without marsupium, from above; × 44.
— 3 c. First left thoracic leg of a female, from behind; × 58.
— 3 d. Second left thoracic leg of the same female, from behind; × 58.
— 3 e. Seventh left thoracic of the same female, from in front; × 58.

Fig. 4. *Desmosoma armatum* G. O. Sars.

Fig. 4 a. Seventh left thoracic leg of a female with marsupium, from behind; × 54.

Fig. 5. *Desmosoma insigne* n. sp.

Fig. 5 a. Female with marsupium (from the "Ingolf" Stat. 36), from above; × 18.
— 5 b. Fifth thoracic segment of the female shown in fig. 5 a, from above; × 26.
— 5 c. Fifth thoracic segment of a male, from above; × 26.
— 5 d. First left thoracic leg of an adult female, from behind; × 37.

Fig. 5 e. Second left thoracic leg of the same female, from behind; × 37.
— 5 f. Seventh right thoracic leg of the same female, from in front; × 37.
— 5 g. Posterior part of abdomen with uropods of a female, from below; × 37.

Fig. 6. *Desmosoma plebejum* n. sp.

Fig. 6 a. Female with marsupium, from above; × 33.
— 6 b. First right thoracic leg of a female, from behind; × 80.
— 6 c. Major part of seventh right thoracic leg of the same female, from in front; × 78.
— 6 d. End of abdomen with uropods of a female, from below; × 78.

Fig. 7. *Ilyarachna hirticeps* G. O. Sars.

Fig. 7 a. Proximal parts of antennulæ and of right antenna of a female with marsupium from Lat 63°15′ N., Long. 22°23′ W., from above; × 23. *sq.* squama (exopod).

Fig. 8. *Ilyarachna bicornis* n. sp.

Fig. 8 a. Anterior major part of the body of a female without marsupium, from above; × $^{15}/_{2}$.
— 8 b. Right antennula and proximal part of right antenna of the same specimen, from above; × 25.
— 8 c. Distal major part of seventh right leg, from behind; × $^{35}/_{2}$.

Fig. 9. *Ilyarachna dubia* n. sp.

Fig. 9 a. Body of an immature female, 3·8 mm. long, from above; × $^{25}/_{2}$.
— 9 b. Antennulæ and proximal part of right antenna of the same specimen from above; × 34.
— 9 c. Distal major part of seventh left leg, from in front; × 24.

Fig. 10. *Ilyarachna spinosissima* n. sp.

Fig. 10 a. Male, from above; scarcely × 14.
— 10 b. Proximal parts of left antennula and antenna of the same male, from above; × 28.
— 10 c. Distal part of left mandible, from below; × 39.
— 10 d. Distal major part of second left leg, from behind; scarcely × 15.
— 10 e. Fifth left leg, from in front; scarcely × 15.

Plate XII.

Fig. 1. *Ilyarachna spinosissima* n. sp. (continued).

Fig. 1 a. Left maxilliped, from below; × 34.
— 1 b. Abdomen and the two posterior thoracic segments of the male shown on the preceding plate, from above; × 21.
— 1 c. Left uropod of a female, from below; × 53.

Fig. 2. *Echinozone arctica* n. sp.

Fig. 2 a. Male, from above; × 21.
— 2 b. Antennulæ and proximal part of right antenna, from above; × 85.
— 2 c. Left uropod, from below; × 132. *ex.* exopod.

Fig. 3. *Storthyngura magnispinis* Richardson.

Fig. 3 a. Male from the "Ingolf" Stat. 36, from above; × 13.
— 3 b. Head and first thoracic segment of the same male, from above; × 22.
— 3 c. Left mandible of a female; from below; × 35.
— 3 d. Left maxilliped of a female, from below; × 35.
— 3 e. First left thoracic leg of a female, from behind; × 24.
— 3 f. Second left thoracic leg of the same female, from behind; × 24.
— 3 g. Third left thoracic leg of the same female, from behind; × 24.
— 3 h. Fifth left thoracic leg of the same female, from in front; × 24.
— 3 i. Seventh left thoracic leg of the same female, from in front; × 24.
— 3 k. Abdomen and posterior end of last thoracic segment of a female without marsupium, from below; × 23.
— 3 l. Operculum of the male shown in fig. 3 a, from below; × 32.
— 3 m. Posterior part of first pair of male pleopods, from below; × 55.
— 3 n. Second left male pleopod, from below; × 36.

Fig. 4. *Syneurycope parallela* n. gen., n. sp.

Fig. 4 a. Male from the right side; × 13. Major part of the antenna lost.
— 4 b. Same male, from above; × 13.
— 4 c. Right antennula, from the outer side; × 25.
— 4 d. Front end of head with the four proximal joints of right antenna, from the outer side; × 25.
— 4 e. Left mandible, from below; × 25.
— 4 f. Left maxilliped, from below; × 59.
— 4 g. Inner margin of fifth joint of left maxilliped, from below; × 148.
— 4 h. First right thoracic leg from the outer side; × 23.
— 4 i. Distal half of first right thoracic leg, from the outer side; × 38.
— 4 k. Second right thoracic leg, from the outer side; × 23.
— 4 l. Fifth right thoracic leg, from the outer side; × 23.
— 4 m. Terminal part of fifth right leg, from the outer side; × 50.
— 4 n. Seventh right thoracic leg, from the outer side; × 23.
— 4 o. Terminal part of abdomen with right uropod, from the right side; × 59. *ex.* exopod.

Fig. 5. *Munnopsurus giganteus* G. O. Sars.

Fig. 5 a. Proximal part of the left maxilliped of a female without marsupium, from below; × 8. *st.* sternite, to which the maxillipeds are attached; *pcx.* præcoxa; *cx.* coxa (hitherto generally considered as first joint of the maxilliped); *bas.* basis (hitherto counted as second joint); *ep.* proximal part of the epipod. The greyish parts are thin membrane.

Fig. 6. *Munnopsurus longipes* Tattersall.

Fig. 6 a. Left mandible of a male, from below; × 10.
— 6 b. Distal parts of first pair of male pleopods, from below; × 15.

Fig. 7. *Eurycope Murrayi* Walker.

Fig. 7 a. Left maxilliped of a male, from below; × 18.
— 7 b. Distal half of second left male pleopod, from below; × 25.

Fig. 8. *Eurycope cornuta* G. O. Sars.

Fig. 8 a. The front cephalic area of a female, from above; × 36.
— 8 b. Proximal joints of right antennula of a female, from above; × 26.
— 8 c. Proximal joints of right antennula of a male, from above; × 26.
— 8 d. Proximal joints of right antennula of a another male from the same locality, from above; × 26.
— 8 e. Third and fourth joints of left antenna of a female, from above; × 32. *sq.* squama (exopod).
— 8 f. Abdomen and posterior thoracic segment of a female (from Skager Rak), from the left side; × 12.
— 8 g. Operculum (second pair of pleopods fused) of a female, from below; × 16.
— 8 h. First pair of male pleopods, from below; × 21.
— 8 i. Distal part of the pleopods shown in fig. 8 h, from below; × 32.
— 8 k. Second left male pleopod, from below; × 21.

Plate XIII.

Fig. 1. *Eurycope nodifrons* n. sp.

Fig. 1 a. Male, from above; × 9.
— 1 b. Head and anterior half of first thoracic segment of the same male, from above; × 15.
— 1 c. Left maxilliped of the same male, from below; × 36.
— 1 d. Major distal part of first pair of male pleopods, from below; × 31.

Fig. 2. *Eurycope inermis* n. sp.

Fig. 2 a. Female without marsupium from the "Ingolf" Stat. 103, from above; scarcely × 6.
— 2 b. Head and the two anterior thoracic segments of the same female, from above; × 11.
— 2 c. Proximal part of right antennula of a male from the "Ingolf" Stat. 113, from above; × 22.
— 2 d. Third joint with exopod and fourth joint of left antenna of the female shown in fig. 2 a, from above; × 19.
— 2 e. Left maxilliped of a female from the "Ingolf" Stat. 117, from below; × 19.
— 2 f. First pair of pleopods of a male from Stat. 117, from below; × 22.
— 2 g. Distal part of the pleopods shown in fig. 2 f, from below; × 40.
— 2 h. Second left pleopod of the last-named male, from below; × 22.
— 2 i. Abdomen and posterior part of seventh thoracic segment of a female without marsupium from the "Ingolf" Stat. 35, from the left side; × 15.
— 2 k. Abdominal operculum of a female from the "Ingolf" Stat. 117, from below; × 15.
— 2 l. Right uropod of a female from Stat. 117, from below; × 23.

Fig. 3. *Eurycope Hanseni* Ohlin.

Fig. 3 a. The front cephalic area with its keels of a female from the "Ingolf" Stat. 118, from above; × 32.

— 3 b. Proximal part of right antennula of a female from the "Ingolf" Stat. 113, from above; × 15.

— 3 c. Third joint with exopod (*ex.*) and fourth joint of left antenna of a female from Stat. 118, from above; × 22.

— 3 d. Distal part of first pair of pleopods of a male from Stat. 113, from below; × 34.

— 3 e. Posterior part of abdomen, showing uropods, anal doors, and the distal part of the operculum, of a female from Stat. 118, from below; × 16.

Fig. 4. *Eurycope complanata* Bonnier.

Fig. 4 a. Head and first thoracic segment of a male from the "Ingolf" Stat. 36, from above; × 21.

— 4 b. Outline of the front cephalic area of the same male, from above; × 52.

— 4 c. First pair of male pleopods, from below; × 46.

— 4 d. Second left pleopod of a male, from below; × 46.

— 4 e. Operculum of a female, from below; × 26.

Fig. 5. *Eurycope brevirostris* n. sp.

Fig. 5 a. Male, from the "Ingolf" Stat. 138, from above; × 23.

— 5 b. Head and first thoracic segment of the male shown in fig. 5 a, from above; × 35.

— 5 c. The front cephalic area with its keels of the male shown in fig. 5 a, from above; × 75.

— 5 d. Third joint with exopod (*ex.*) and fourth joint of left antenna of a male, from above; × 92.

— 5 e. Left maxilliped of a female, from below; × 48.

— 5 f. First pair of pleopods of a male, from below; × 57.

— 5 g. Second left pleopod of the same male, from below; × 57.

— 5 h. Operculum of a female, from below; × 33.

— 5 i. Left uropod of a male, from below; × 80.

Fig. 6. *Eurycope producta* G. O. Sars.

Fig. 6 a. Epipod of left maxilliped of a small female from the "Ingolf" Stat. 78; × 45.

Fig. 7. *Eurycope parva* Bonnier.

Fig. 7 a. Left part of the head — with the proximal joint of antennula and antenna — and of first thoracic segment of a female taken by the "Ingolf", from above; × 45.

— 7 b. Proximal part of right antennula of a female taken by the "Thor", from above; × 49.

— 7 c. Left maxilliped of a female captured by the "Thor", from below; × 34.

— 7 d. Abdomen and posterior part of the thorax of an ovigerous female taken by the "Thor", from the left side; × 31.

— 7 e. Abdominal operculum of a female taken by the "Thor", from below; × 33.

Fig. 8. *Eurycope phallangium* G. O. Sars.

Fig. 8 a. Head with the anterior part of first thoracic segment of a full-grown female without marsupium from the "Ingolf" Stat. 25, from above; × 50.

Fig. 9. *Eurycope furcata* G. O. Sars.

Fig. 9 a. Head with the anterior part of first thoracic segment of a female without marsupium from the "Ingolf" Stat. 78, from above; × 53.

— 9 b. Outline of the front cephalic area of a female from Norway, from above; about × 50.

Fig. 10. *Eurycope mutica* G. O. Sars.

Fig. 10 a. Left part of the head, with most of the antennula and the proximal joints of the antenna, of a female from Naalsö, the Færoes, from above; × 85. *ex.* exopod of the antenna.

— 10 b. Abdomen of a male from Faskruds Fjord, East Iceland, from below; × 45.

— 10 c. Distal part of first pair of pleopods of a very small male from Naalsö, the Færoes, from below; × 109.

Fig. 11. *Paramunnopsis oceanica* Tattersall.

Fig. 11 a. Right antennula of a male, from above; × 24. Most of the flagellum omitted.

— 11 b. Part of the peduncle of right antenna of a male, from above; × 24. *ex.* exopod.

— 11 c. Left mandible of a female without marsupium, from below; × 31.

— 11 d. The incisive part of a the same mandible, from in front; × 65.

— 11 e. Molar process of the same mandible, from above; × 150.

— 11 f. Left maxilliped of the same female, from below; × 22.

— 11 g. First pair of pleopods of a male, from below; × 23.

— 11 h. Distal part of the pleopods shown in fig. 11 g, from below; × 58.

— 11 i. Second pair of pleopods of the same male, from below; × 23. About the proximal third of the two pleopods completely fused in the median line.

Plate XIV.

Fig. 1. *Paramunnopsis oceanica* Tatt. (continued).

Fig. 1 a. Male, from above; scarcely × 9.

— 1 b. Female abdominal operculum, from below; × 14.

Fig. 2. *Munnopsoides eximius* n. sp.

Fig. 2 a. Female without marsupium, from above; × 7.

— 2 b. Anterior half of the same female, from the right; × 7.

— 2 c. Left mandible of a female, from below; × 27.

— 2 d. Left maxilla of the same female, from below; × 27.

— 2 e. Left maxilliped of the same female, from below; × 21.

— 2 f. Right antennula, from above; × 25.

— 2 g. First left thoracic leg of a female, from behind; × 13.

— 2 h. Second left thoracic leg of the same female, from behind; × 13.

— 2 i. Seventh left thoracic leg of a male; × 14.

— 2 k. Median lamella of the male abdominal operculum, from below; × 22.

— 2 l. Distal part of the lamella shown in fig. 2 k, from below; × 50.

Fig. 2 m. Same median lamella of the male operculum, from the left; × 22.

— 2 n. Second left male pleopod, from above; × 22. It is seen that the copulatory organ terminates in an extremely long thread, *t*, *t*, which has been turned around the pleopod.

Fig. 3. *Pseudomunnopsis Beddardi* Tattersall.

Fig. 3 a. Male, from above; scarcely × 9.

— 3 b. Anterior half of a female, from above; scarcely × 9.

— 3 c. Left mandible of a female, from below; × 33. *p.* plate for the attachment of the *musculus adductor.*

— 3 d. Left maxilla of the same female, from below; × 33.

— 3 e. Left maxilliped of the same female, from below; × 24.

— 3 f. Distal part of the maxilliped shown in fig. 3 e, from below; × 56.

— 3 g. First left thoracic leg of a female, from below; × 23.

— 3 h. Median lamella of the male abdominal operculum, from below; × 15.

— 3 i. Distal part of the lamella shown in fig. 3 h, from below; × 15.

— 3 k. Second pair of male pleopods, fused and constituting a large plate with a somewhat deep and narrow terminal incision, in which the copulatory organs are seen, from below; × 15.

— 3 l. Distal part of the plate shown in fig. 3 k, exhibiting the median incision, one of the copulatory organs and one of the thick coupling hooks with the musculature visible through the integument, from below; × 45.

— 3 m. Posterior part of abdomen with anal doors and uropods of a male, from below; × 32.

Fig. 4. *Cirolana borealis* Lilljeborg.

Fig. 4 a. Proximal half of first left pleopod, from in front; × $^{11}/_{2}$. *st.* sternite; *1 i.* inner plate of first joint, *præcoxa*, formed by the fusion in the median line of two chitinized pieces belonging to both left and right pleopod; *1 o.* outer chitinized plate of first joint near the outer margin of the pleopod; *2.* small chitinized plate representing second joint — the remainder of that joint membranous; *3.* third well-chitinized joint; *en.* endopod; *ex.* exopod.

Fig. 5. *Eurydice caeca* n. sp.

Fig. 5 a. Male, from above; × 6.

— 5 b. Anterior part of the head, with right antennula and the proximal joints of left antennula and both antennæ, of the same male, from below; × 18. *f.* lamina frontalis; *c.* clypeus; *l.* labrum.

— 5 c. Distal half of left mandible, from above; × 53. *c.* condylus; *m.* molar process. Palp omitted.

— 5 d. Molar process of the same mandible, from below; × 135.

— 5 e. Right maxilliped, from above; × 83. *l².* lobe from second joint.

— 5 f. Second left thoracic leg, from behind; × 20.

— 5 g. Fifth left leg, from in front; × 20.

— 5 h. Seventh left leg, from in front; × 20.

— 5 i. Posterior part of abdomen of the male shown in fig. 5 a, from above; × $^{25}/_{2}$. *a.* posterior margin of the abdomen, more highly magnified.

Fig. 5 k. Second left male pleopod, from in front; × 20. *ap.* distal part of the *appendix masculina*, more highly magnified.

Fig. 6. *Ægа arctica* Lütken.

Fig. 6 a. Proximal half of first left pleopod, from in front; × $^{9}/_{2}$. *st.* sternite; *1 i.* plate of first joint, *præcoxa*, formed by the fusion in the median line of two chitinized pieces belonging to both left and right pleopod; *1 o.* major chitinized plate of first joint; *2 i.* small chitinized inner plate of second joint; *2 o.* large more outer transverse plate of second joint; *3.* third well chitinized joint; *en.* endopod; *ex.* exopod.

Fig. 7. *Bathycopea typhlops* Tattersall.

Fig. 7 a. Anterior part of the head of a male with left antennula and antenna and the proximal parts of right antennula and antenna, from below; × 22. *l.* labrum; *1.* first joint of the antenna. *t.* terminal part of the antenna more highly magnified.
— 7 b. Left antennula of an ovigerous female, from below; × 22.
— 7 c. Left mandible of a female with marsupium, from below; × 46.
— 7 d. Distal part of the same mandible, from behind; × 72.
— 7 e. Left maxillula of the same female, from below; × 46.
— 7 f. Left maxilla of the same female, from below; × 46. *l².* lobe from second joint overlapped by the inner branch of the lobe from third joint, but visible through the branch.
— 7 g. Left maxilliped of the same female, from below; × 46.
— 7 h. Second left thoracic leg of an adult male, from behind; × 23. *p.* proximal part of the lower margin of sixth joint, more highly magnified.
— 7 i. First left leg of an adult male, from behind; × 23.
— 7 k. Distal part of sixth joint and proximal part of seventh joint of the leg shown in fig. 7 i, from behind and more highly magnified.
— 7 l. Fifth leg of the same male, from in front; × 23.

Plate XV.

Fig. 1. *Bathycopea typhlops* Tattersall (continued).

Fig. 1 a. First left pleopod of a male, from below; × 20.
— 1 b. Second left pleopod of the same male, from below; × 20.
— 1 c. Third left pleopod of the same male, from below; × 20.
— 1 d. Fourth left pleopod of the same male, from below; × 20.
— 1 e. Fifth left pleopod of the same male, from below; × 20.

Fig. 2. *Cyathura truncata* n. sp.

Fig. 2 a. Anterior part of the head of a female, from above; × 28.
— 2 b. Distal part of right antenna of the same female, from above; × 53.
— 2 c. Left mandible of a female, from below; × 60.
— 2 d. Paragnatha with distal part of right maxillula (*mxl*) of a female, from below; × 60.

Fig. 2 e. Major part of left maxillula, from below; × 60. *l*[1], lobe from first joint.
— 2 f. Distal part of the outer lobe of the maxillula shown in fig. 2 e, from below; × 180.
— 2 g. Maxillipeds of the same female, from below; × 60.
— 2 h. First left thoracic leg of a female, from the outer side; × 22.
— 2 i. Seventh joint with claw of the leg shown in fig. 2 h, from the outer side; × 46.
— 2 k. Second left thoracic leg of a female, from the outer (posterior) side; × 22.
— 2 l. Seventh left thoracic leg of the same female, from the anterior side; × 22.
— 2 m. Abdomen and posterior part of thorax of a female, from above; × 13. Setæ omitted.
— 2 n. First left pleopod of the same specimen, from below; × 24.
— 2 o. Second left pleopod of the same female, from below; × 24.
— 2 p. Right uropod of the same female, from the outer side; × 24. *ex.* exopod.
— 2 q. Telson of a female, from below; × 24. *s.* statocysts.
— 2 r. The statocysts of the telson shown in the preceding figure; × 80.

Fig. 3. *Calathura brachiata* Stimpson.

Fig. 3 a. Proximal part of telson, from below; × 17. The integument on the lower side has been removed in order to show the organ, *s.* the statocyst.

Fig. 4. *Mesidothea Sabini* Kröyer.

Fig. 4 a. Major proximal part of left maxilliped of a male, from below; × $^{13}/_{3}$. *1.* first joint; *2.* second joint; *l*[2]. lobe from second joint; *3.* third joint; *4.* fourth joint; *5.* fifth joint; *ep.* epipod, divided into a basal part, *b,* and a distal part, *d.*
— 4 b. Major proximal part of left maxilliped of an ovigerous female, from below; × 5. The lettering as in fig. 4 a.

Fig. 5. *Arcturus Baffini* Sabine.

Fig. 5 a. The sympod with the proximal parts of the rami of first right pleopod of a female, from in front; × $^{15}/_{2}$. The number *3.* above the figure is a misscript for *1.* and indicates the first joint; *2.* second joint, and *3.* third long joint of the sympod.

Fig. 6. *Pleuroprion hystrix* G. O. Sars.

Fig. 6 a. Anterior right part of the head with right antennula and most of the peduncle of right antenna of a female, from above; × $^{21}/_{2}$.
— 6 b. Abdomen of a female, from above; × 10.

Fig. 7. *Pleuroprion frigidum* n. sp.

Fig. 7 a. Anterior right part of the head with right antennula and most of the peduncle of right antenna of a female, from above; × $^{15}/_{2}$.
— 7 b. Abdomen of a female, from above; × $^{15}/_{2}$.

Fig. 8. *Astacilla (?) arietina* G. O. Sars.

Fig. 8 a. Abdomen of a young female, from the left side; × 10.
— 8 b. Distal part of left antenna of a young female, from the outer side; × 13.

Fig. 9. *Astacilla granulata* G. O. Sars.

Fig. 9 a. Left maxilliped of a male, from below; × 25. *1.* first joint; *2.* second joint; *ep.* epipod, in which the basal part, *b*, is not marked off from the distal part, *d*.

— 9 b. Left maxilliped of an ovigerous female, from below; × 25. Setæ omitted. *1.* first joint; *2.* second joint; *ep.* epipod, divided into a basal part, *b*, which again is subdivided into two chitinized plates with membrane between them, and the distal part, *d*.

Fig. 10. *Ligia oceanica* Linné.

Fig. 10 a. Peduncle of left antenna, from above and a little from the outer side, scarcely × 3. *1.* first joint; *2.* second joint; *3.* third joint; *ex.* exopod.

Fig. 11. *Bopyroides hippolytes* Kröyer.

Fig. 11 a. Head of a female larva in second stage on *Spirontocaris polaris* from Egedesminde, from below; × 164. Setæ of right antennula omitted.

— 11 b. Left antennula, excepting the proximal major part of first joint, of a male larva from *Spirontocaris spinus* Sow. from Brede Fjord (Greenland), from below; × 225.

— 11 c. First left pleopod of the male from *Spir. polaris* (see above), from in front; × 86.

— 11 d. Sixth and posterior part of fifth abdominal segment of the female larva from Egedesminde, from above; × 123.

Fig. 12. *Pseudione Hyndmanni* Bate & Westwood.

Fig. 12 a. Male larva in second stage, from above; × 47.

— 12 b. Outline of right half of the head with antennula and the three proximal joints of the antenna of the larva shown in fig. 12 a, from below; × 240. *1.* first joint of the antennula.

— 12 c. Sixth and posterior part of fifth abdominal segment and uropods of the same larva, from above; × 135.

Fig. 13. *Phryxus abdominalis* Kröyer.

Fig. 13 a. Left antennula of a male larva in second stage, from below; × 232. The three joints and the two terminal rami are extremely distinct, but the major part of 8 setæ, most of them sensory, are omitted.

Fig. 14. *Dajus mysidis* Kröyer.

Fig. 14 a. Head with antennulæ and mouth of a larva of second stage, from below; × 170. The antennæ and the setæ on the long ramus of the antennulæ omitted.

— 14 b. Distal part of seventh right leg of the same larva, from in front; × 145.

Fig. 15. *Dajus profundus* n. sp.

Fig. 15 a. Female, from above; × 17.

— 15 b. Female with male, from below; × 24. *m.* male.

— 15 c. Male, from above; × 95.

Fig. 15 d. Head, first thoracic segment with right leg, and anterior part of second segment of the male, from below; × 205.

— 15 e. Seventh left thoracic leg, from in front; × 205.

Fig. 16. *Aspidophryxus peltatus* G. O. Sars.

Fig. 16 a. Head of a male larva in second stage, from below; × 350.

— 16 b. Distal part of seventh right leg of the same larva, from in front; × 290.

Fig. 17. *Clypeoniscus Meinerti* Giard & Bonnier.

Fig. 17 a. Head and first thoracic segment — most of its legs omitted — of a male from *Synidothea nodulosa* Kr., from below; × 145.

Plate XVI.

Fig. 1. *Clypeoniscus Meinerti* Giard & Bonnier (continued).

Fig. 1 a. Fifth left thoracic leg of a male from *Synidothea nodulosa* Kr., from in front; × 125.

— 1 b. Sixth left thoracic leg of the same male from *S. nodulosa* Kr., from in front; × 125.

— 1 c. Seventh left thoracic leg of a male from *Pleuroprion Murdochi* Benedict, from behind; × 125.

Fig. 2. *Arcturocheres pulchripes* n. gen., n. sp.

Fig. 2 a. Female from *Astacilla granulata* G. O. Sars, from the left side; × 8. *l.* legs.

— 2 b. Outline of the mouth of the same female, from below.

— 2 c. Male from *Astacilla granulata* G. O. Sars, from above; × 25.

— 2 d. Head and first thoracic segment — most of its legs omitted — of a male from *Pleuroprion hystrix* G. O. Sars, from below; × 57.

— 2 e. Right antennula of the head shown in fig. 2 d, from below; × 130. The major distal part of the setæ on the end of the long ramus and behind it omitted.

— 2 f. First left thoracic leg of the male shown in fig. 2 c, from behind; × 77.

— 2 g. Fifth left leg of the male shown in fig. 2 c, from in front; × 77.

— 2 h. Sixth left leg of the male shown in fig. 2 c, from in front; × 77.

— 2 i. Distal part of the leg shown in fig. 2 h, from in front; × 155.

— 2 k. Seventh left leg of the male shown in fig. 2 c, from in front; × 77.

— 2 l. First left pleopod of the male from *Pleuroprion hystrix*, from in front; × 77.

Fig. 3. *Astacilloechus Ingolfi* n. gen., n. sp.

Fig. 3 a. Female, from the left side; × 11.

— 3 b. Head of the female, from below; × 32.

— 3 c. Left antennula of the male, from below; × 86.

— 3 d. Sixth left leg of the male, from in front; × 86.

Fig. 4. *Parapodascon Stebbingii* Giard & Bonnier.

Fig. 4 a. Female, from below; × 12.

— 4 b. Male, from above; × 37.

Fig. 4 c. Head and first thoracic segment — most of its legs omitted — of the male, from below; × 85.

— 4 d. Right antennula of the head shown in fig. 4 c, from below; × 195.

— 4 e. Fifth left leg of the male, from in front; × 125.

— 4 f. Distal part of sixth right leg of the male, from behind; × 125.

— 4 g. Seventh right leg of the male, from in front; × 125.

Fig. 5. *Cumoechus insignis* n. gen., n. sp.

Fig. 5 a. Female from *Diastylis polaris* G. O. Sars (the "Ingolf" Stat. 138), from below; × 12. *tr*². second pair of thoracic legs; *ab*. abdominal area.

— 5 b. Anterior right part of an emptied skin of a female from *Diastylis echinata* Bate, from below; × 28. *a*¹. antennulæ; *l*¹. apparently unpaired lamella; *l*². lamella, possibly the empty skin of the antenna; *l*³. lamella projecting a little more backwards and partly overlapped, probably first marsupial lamella; *tr*¹. first thoracic leg; *tr*². second thoracic leg.

— 5 c. Male from *Diastylis polaris* (the "Ingolf" Stat. 113), from above; × 46.

— 5 d. Head and first thoracic segment — most of its legs omitted — of the male from *D. echinata*, from below; × 133.

— 5 e. Right antennula of the head shown in fig. 5 d, from below; × 133. Most of the long setæ totally omitted (comp. fig. 5 d).

— 5 f. Third left thoracic leg of the male from *D. echinata*, from in front; × 120.

— 5 g. Sixth left leg of the same male, from in front; × 120.

— 5 h. Seventh left leg of the same male, from in front; × 120.

— 5 i. Posterior part of fifth abdominal segment, sixth segment and uropods of the male from *D. polaris*, from above; × 130. The terminal setæ on the rami of the uropods nearly or totally omitted.

— 5 k. Larva in first stage taken within the skin of a female from *D. echinata*, from below; × 146. Thoracic legs and pleopods omitted on the right half of the figure.

Fig. 6. *Gnathia robusta* G. O. Sars.

Fig. 6 a. Left mandible of a male from Lat. 70°32′ N., from the outer side; × 22.

— 6 b. Outline of the head, with the proximal joints of left antennula and antenna, of a female from Lat. 69°25′ N., from above; × 21.

Fig. 7. *Gnathia hirsuta* G. O. Sars.

Fig. 7 a. Head of a male from the "Ingolf" Stat. 25, from above; × 11.

— 7 b. Posterior part of abdomen with left uropod of the same male, from above; × 27.

Fig. 8. *Gnathia abyssorum* G. O. Sars.

Fig. 8 a. Anterior part of the head with mandibles and the proximal joints of the antennulæ of a male from Lat. 64° N., from above; × 25.

— 8 b. Front part of the lower side of the head of the same male, from below; × 25.

Fig. 9. *Gnathia albescens* n. sp.

Fig. 9 a. Male, from above; $\times$ 15. Caudal setæ omitted.
— 9 b. Anterior half of the head with right antennula (a^1), left antenna (a^2), and the proximal part of left antennula (a^1) of a male, from above; $\times$ 38.
— 9 c. Left maxilliped of a male, from below; $\times$ 32.
— 9 d. First left thoracic leg of the same male, from below; $\times$ 32.
— 9 e. Second left thoracic leg of a male, from the outer side; $\times$ 32.
— 9 f. Posterior part of abdomen with right uropod of a male, from above; $\times$ 46.
— 9 g. Head of a larva, from above; $\times$ 44. Left antenna and most of left antennula omitted.
— 9 h. Posterior part of abdomen with right uropod of the same larva, from above; $\times$ 50.

Fig. 10. *Gnathia bicolor* n. sp.

Fig. 10 a. Male, from above; $\times$ 11. Caudal setæ omitted.
— 10 b. Second left thoracic leg of the male from the outer side; $\times$ 32.
— 10 c. Last abdominal segment with left uropod of the male, from above; $\times$ 31.

1. Ianira maculosa Leach. 2. I. alta Stimps. 3. I. tricornis Kr. 4. I. pulchra n. sp. 5. I. laciniata G.O.S.
6. Acanthaspidea typhlops G.O.S. 7. Ianirella spongicola n. sp. 8. I. laevis n. sp.
9. Katianira chelifera n. gen., n. sp.

H. J. Hansen del. F. E. Møller sc.

1. Katianira chelifera n. gen., n. sp. 2. Haploniscus bicuspis G.O.S. 3. H. spinifer n. sp.
4. H. armadilloides n. sp. 5. Hydroniscus abyssi n. gen., n. sp.

H. J. Hansen del. T. N. Møller sc.

1. Munna Boeckii Kr. 2. M. groenlandica n. sp. 3. M. Hanseni Stappers. 4. M. Kröyeri Goodsir. 5. M. Fabricii Kr.
6. M. minuta n. sp. 7. M. acanthifera n. sp. 8. Pleurogonium inerme G.O.S. 9. P. latimanum n. sp.
10. P. intermedium n. sp. 11. P. rubicundum G.O.S. 12. P. pulchrum n. sp.

H. J. Hansen del. F. E. Møller sc.

1. Pseudomunna hystrix n. gen., n. sp.   2. Dendrotion spinosum G.O.S.   3. D. paradoxum n. sp.
4. Schistosoma ramosum n. gen., n. sp.   5. Ischnomesus profundus n. sp.   6. I. armatus n. sp.

H. J. Hansen del.   T. N. Möller sc.

1 Haplomesus quadrispinosus G. O. Sars. 2 H. angustus n. sp. 3 H. insignis n. sp. 4 H. tenuispinus n. sp. 5 H. modestus n. sp. 6 Heteromesus dentatus n. sp.

H. J. Hansen del. *F. H. Møller sc.*

1 Heteromesus dentatus n. sp. 2 H. longiremis n. sp. 3 H. Schmidtii n. sp. 4 H. frigidus n. sp.

5 Pseudomesus brevicornis n. gen., n. sp. 6 Macrostylis spinifera G. O. S.

H. J. Hansen del. F. K. Møller sc.

1 Macrostylis spinifera G.O.S. 2 M. abyssicola n. sp. 3 M. elongata n. sp. 4 M. subinermis n. sp.
5 M. longiremis Mein. 6 M. longipes n. sp. 7 Nannoniscella groenlandica n. gen., n. sp.

H. J. Hansen del. T. N. Møller sc.

1 Nannoniscella groenlandica n. gen. n. sp. 2 Nannoniscoides angulatus n. gen. n. sp.
3 Nannoniscus simplex n. sp. 4 N. oblongus G.O.S. 5 N. arcticus n. sp. 6 N. analis n. sp.

H. J. Hansen del. T. N. Møller sc.

1. Nannoniscus analis n. sp. 2. N. reticulatus n. sp. 3. N. laticeps n. sp. 4. N. inermis n. sp.
5. N. æquiremis n. sp. 6. N. plebejus n. sp. 7. N. minutus n. sp.

H. J. Hansen del. F. W. Müller sc.

1. Nannoniscus armatus n. sp. 2. N. spinicornis n. sp. 3. N. affinis n. sp. 4. Desmosoma globiceps Mein.
5. D. latipes n. sp. 6. D. longispinum n. sp. 7. D. simile n. sp. 8. D. politum n. sp.

H. J. Hansen del. T. N. Möller sc.

1 Desmosoma gracilipes n. sp. 2 D. natator n. sp. 3 D. laterale G.O.S. 4 D. armatum G.O.S. 5 D. insigne n. sp.
6 D. plebejum n. sp. 7 Ilyarachna hirticeps G.O.S. 8 I. bicornis n. sp. 9 I. dubia n. sp. 10 I. spinosissima n. sp.

H. J. Hansen del. T. N. Møller sc.

1 Ilyarachna spinosissima n. sp. 2 Echinozone arctica n. sp. 3 Storthyngura magnispinis Rich. 4 Syneurycope parallela n. gen. n. sp. 5 Munnopsurus giganteus G.O.S. 6 M. longipes Tatt. 7 Eurycope Murrayi Walk. 8 E. cornuta G.O.S.

H.J. Hansen del. F.S. Müller sc.

1 Eurycope nodifrons n. sp. *2 E. inermis* n. sp. *3 E. Hanseni* Ohlin. *4 E. complanata* Bonn. *5 E. brevirostris* n. sp.
6 E. producta G. O. S. *7 E. parva* Bonn. *8 E. phallangium* G. O. S. *9 E. furcata* G. O. S. *10 E. mutica* G. O. S.
11 Paramunnopsis oceanica Tatt.

H. J. Hansen del. T. N. Möller sc.

1 Paramunnopsis oceanica Tatt. 2 Munnopsoides eximius n. sp. 3 Pseudomunnopsis Beddardi Tatt.
4 Cirolana borealis Lilljb. 5 Eurydice caeca n. sp. 6 Æga arctica Lutk.
7 Bathycopea typhlops Tatt.

1 Bathycopea typhlops Tatt. 2 Cyathura truncata n. sp. 3 Calathura brachiata Stimps. 4 Mesidothea Sabini Kr. 5 Arcturus Baffini Sab. 6 Pleuroprion hystrix G.O.S. 7 P. frigidum n. sp. 8 Astacilla arietina G.O.S. 9 A. granulata G.O.S. 10 Ligia oceanica L. 11 Bopyroides hippolytes Kr. 12 Pseudione Hyndmanni B.&W. 13 Phryxus abdominalis Kr. 14 Dajus mysidis Kr. 15 D. profundus n. sp. 16 Aspidophryxus peltatus G.O.S. 17 Clypeoniscus Meinerti G.&B.

H. J. Hansen del.　　F. B. Møller sc.

1. Clypeoniscus Meinerti G. & B. 2. Arcturocheres pulchripes n. gen. n. sp. 3. Astacilloechus Ingolfi n. gen. n. sp.
4. Parapodascon Stebbingii G. & B. 5. Cumoechus insignis n. gen. n. sp. 6. Gnathia robusta G. O. S. 7. G. hirsuta G. O. S.
H. J. Hansen del. 8. G. abyssorum G. O. S. 9. G. albescens n. sp. 10. G. bicolor n. sp. F. E. Möller sc.

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′3	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					

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VOL. III. PART 6.

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H. J. HANSEN, CRUSTACEA MALACOSTRACA. IV.

PUBLISHED AT THE COST OF THE GOVERNMENT

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CRUSTACEA MALACOSTRACA. IV.

BY

H. J. HANSEN.

WITH 4 PLATES AND A LIST OF STATIONS.

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Crustacea Malacostraca. IV.

By

H. J. Hansen.

VI. The Order *Cumacea.*

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 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.

Our earlier knowledge of the Cumacea living at the coasts of Greenland in depths down to nearly a hundred fathoms was rather good, but as to the fauna of the deeper tracts of the adjacent seas it was very poor. In 1887 I recorded 16 species, deep-sea forms included, belonging to the fauna of West Greenland; in 1913 K. Stephensen enumerated only the same number for both sides of Greenland. From the coasts of Iceland only 2 species of Cumacea have been recorded (by G. O. Sars), and none from the Færoes; from the deeper tracts around Iceland and the areas north-west, west, and south-west of the Færoes (southwards to Lat. 60° N.) scarcely more than a single species was known. In the present paper 66 species are enumerated, and all, excepting 2 species from very deep water and not seen by me, have been secured by Danish expeditions; 24 species are described as new. The "Ingolf" has gathered 41 species; 18 species have been taken exclusively by that expedition, and 14 species are new to science. During the cruizes of the "Thor" Dr. Joh. Schmidt brought together a magnificent material; he captured no less than 33 species (species secured at places outside the "Ingolf" area not included); 16 of these species were taken exclusively by him, and 8 are new to science. Among the new species described on the following pages only 1 has been taken by two expeditions, viz. both by the "Ingolf" and the "Thor". Only 9 of the 66 species have not been met with either by the "Ingolf" or the "Thor"; 3 of them are new to science and have been gathered by the IInd Amdrup-Expedition (Mag. sc. Søren Jensen), while the 2 species not seen by me were captured by the "Valorous" (Rev. Canon A. M. Norman). Of course a number of the species taken by the "Ingolf" or the "Thor" have also been gathered by various other Danish expeditions or collectors.

A comparison with the fauna of Norway and Great Britain may be of some interest, as the Malacostraca in the seas at these countries have been more thoroughly investigated than in any other area of our globe. In his "Account" (1899—1900) G. O. Sars described 49 species from Norway, and of these 21 are unknown from the "Ingolf" area, but some among them will certainly be found there in the future. Of the Cumacea of Great Britain and Ireland no complete faunistic list exists, but in looking over Stebbing's work in "Das Tierreich" I found that the British fauna comprises 60 species, when "off Rockall" and the sea between Rockall and Ireland is included; of these species only 22 are known from the "Ingolf" area. According to the numbers given the seas around our northern dependencies have been proportionately rather well explored, though it is quite certain that many forms living in the warm area, and especially in depths from 300 to 600 fathoms, have not yet been discovered.

On the Literature.

On this topic very little need to be said. During the years 1899—1913 a series of very important papers have been published by G. O. Sars, W. T. Calman, T. R. R. Stebbing and C. Zimmer. In his book on the Cumacea in "Das Tierreich", 39. Lief., 1913, Stebbing has compiled and quoted the whole literature until 1912, and for this reason I have referred to his most useful book in the synonymical list at every species. Zoologists wishing to get further knowledge on synonymy than the generally rather few references in the present paper can easily find them in "Das Tierreich". Zimmer's original contribution to the knowledge of the northern fauna is of slight importance, but his paper on the Cumacea in "Deutsche Südpolar-Expedition 1901—1903" Bd. XIV, Zool., VI, p. 438—491 (published in 1913) contains a very interesting chapter; "Zirkumpolarität und Bipolarität" (p. 483—488), in which an outline of the classification of families and genera followed by me is given, together with the number of species of each genus in the five climatic zones of the oceans.

Results and Questions.

A. The Material.

A comparison of the Cumacea from the "Ingolf" area with the world's fauna of the same order may be of some interest. In 1913 Stebbing states to have enumerated 309 accepted and 23 doubtful species; of the latter category the great majority will certainly disappear as unrecognizable for ever or synonyms, and only a few species have been established since 1913. If we therefore put the total number of valid species hitherto established to 315, we must be near the truth. Compared with that number 66 species from the "Ingolf" area is perhaps somewhat more than might be expected.

The latest arrangement of families and their genera of the world's fauna is that published by Zimmer in 1913; it differs rather little from that adopted by Calman, and Calman's arrangement differs somewhat from that by Sars in 1899—1900. Zimmer accepted only 7 families, and it is very interesting that 6 of these are represented in the "Ingolf" area, while of the seventh family, the Ceratocumidæ, only a single species is known. Yet it may be added that the large family Bodotriidæ, which has very few species in the cold areas of the ocean and numerous forms in tropical seas, is poorly represented in the "Ingolf" area, while the somewhat smaller family Leuconidæ, of which not a single species is tropical, has a very high number of species, viz. 22, in our area.

As to number of species in our area a comparison of the Cumacea with Isopoda and Tanaidacea is rather suggestive. Of the order Tanaidacea Sars described 28 species from Norway, while I (1913) enumerated from the "Ingolf" area 78 species, 52 of which were new to science; of Isopoda Sars has 84 species from Norway, while I (1916) counted from our area 164 species, 70 of which were new. Compared with these astonishing results the outcome as to Cumacea is proportionately moderate, viz. from Norway according to Sars 49 species, while I enumerate 66 species, 24 among them new. As a very large number of the Tanaidacea and many Isopoda are smaller and not more easy to detect in sifted bottom material than the Cumacea, and as the animals of all three orders have been searched after with the same care and interest in the same samples, it follows that the fauna in our area of the last-named order must be much less exceeding that of Norway (or Great Britain) than is the case with that of Tanaidacea and Isopoda in proportion to the Norwegian (or British) fauna of these orders. An explanation can partly be derived from some facts to be pointed out later on as to bathymetrical distribution.

B. The Classification.

The shape and morphological structure of the appendages is on the whole well known at least in one form and frequently in some species of most genera. Nevertheless, the value of a number of genera is rather questionable, and, what is more important, some of the families are not very well defined. G. O. Sars, the first author who divided the order into families, accepted in 1879 8, in 1899-1900 9 families; Calman established a new family on an aberrant form discovered at Ireland, but both the last-named author and C. Zimmer pointed out in various papers the difficulty or impossibility of maintaining a few of the older families, and the result is that 3 were cancelled, so that Zimmer in 1913 has 7 families; this arrangement is, I think, the best hitherto proposed. Stebbing divided in 1912 and in "Das Tierreich", 1913, the order into 26 families, but this radical splitting has already been criticized by Zimmer, and I cannot follow the highly meritorious English author in his classification. But his attempt has a peculiar interest, because it is a symptom or indirect indication of the difficulty every Zoologist will find in trying to circumscribe natural and well defined families in this order. In my opinion we must know at least twice, perhaps three times as many species as hitherto described — especially of the fauna living in from 100 to about 600 fathoms in tropical and subtropical seas — before we can hope to ameliorate the classification in points essential. And perhaps the task will prove itself partly insoluble, as seems to be the case in the suborder Amphipoda Gammarida.

In the present paper not the slightest attempt of reform as to families has been made. The large material contained certainly a good number of new species, but not one among them differed so much from a previously well-known species, that it became necessary or even possible to establish a new genus for its reception. And the types of the genera dealt with here were all well studied. The only thing I could make is in a few cases to lay more stress than generally made on some differences serviceable as specific characters; for inst. the shape, relative size and serration of the joints in third pair of maxillipeds in *Procampylaspis* and *Campylaspis* (and perhaps in several other genera) ought to be considered more carefully than generally believed

C. Geographical and bathymetrical Distribution.

It is an interesting fact, that in the cold deep-sea area, with depths from about 300 to 1309 fathoms and the temperature at the bottom below zero, only 9 species have been taken, and that not a single species among these is exclusively limited to that area. Among these species two, viz. *Leucon fulvus* G. O. S. and *L. Nathorstii* Ohlin, have in that area only been taken at Stat. 126, 293 fath., temp. ÷ 0.5°, thus near the limit of the area; *L. Nathorstii* has also been found in Davis Strait, 318 fath., temp. 3.9°, while *L. fulvus* was secured at six stations in Davis Strait, in depths from 88 to 1199 fath., and temperature from 1.6° to 3.9°, and besides in low water at Iceland, etc. *Leucon spinulosus* n. sp. has been taken south of Jan Mayen in 1003 fath., temp. ÷ 1.0°, but besides at three deep stations in the warm area, in 582 to 1435 fath., temp. 3.3—1.5°. *Campylaspis intermedia* n. sp. has been taken south of Jan Mayen, 371 fath., temp. ÷ 0.4°, and besides in Davis Strait, 318 fath., temp. 3.9°. *Leptostylis villosa* G. O. S. has been gathered two times in the cold area, in 293 and 471 fath., temp. ÷ 0.5° and ÷ 0.6°, but besides in the warm area in Davis Strait, 318 fath., temp. 3.9°, in low water at Iceland, furthermore south and north of Iceland in depths between about 18 and 194 fath. *Leptostylis longimana* G. O. S. has been taken five times in the cold area, 471—762 fath., temp. ÷ 0.6— ÷ 0.9°, but is was also secured at two typical stations in the warm area (and at several places in the North Sea, south-east of our area). *Diastylis Rathkii* Kr. was taken in the cold area, 471 fath., temp. ÷ 0.6°, and several times in the warm area down to 420 fath., and in lower water. *Diastylis spinulosa* Heller was gathered once in the cold area, 537 fath., temp. ÷ 0.7°, but besides in Davis Strait in depths from 48 to about 200 fath. and the bottom temperature above zero. *Diastylis polaris* G. O. S. (= *D. stygia* G. O. S.) may be called a typical inhabitant of the cold area, and the "Ingolf" captured it at ten such stations in depths from 371 to 1309 fath., temp. ÷ 0.4°— ÷ 1.1°, but the same ship gathered also specimens in the warm area, in Davis Strait, 582 fath., temp. 3.3°, and Calman records it from many stations off America between Lat. 41½° N. and Lat. 37°25′ N., depths generally from 1149 to 1769 fathoms. It is interesting that, while 8 species of Tanaidacea and 15 species of Isopoda are in my earlier "Ingolf"-papers recorded as only taken in the cold deep-sea area, not a single species of Cumacea is limited to that area.

We find also considerable differences as to bathymetrical distribution between Tanaidacea and Isopoda on one hand and the Cumacea on the other. At the deepest "Ingolf" station, Stat. 38, 1870 fath., temp. 1.3°, 9 species of Tanaidacea and 8 species of Isopoda were secured, but not a single specimen of Cumacea. At Stat. 78 (799 fath., temp. 4.5°) an enormous bottom material, especially sponges, was hauled up, and it contained 9 species of Tanaidacea and 22 species of Isopoda, but only 2 species of Cumacea. Stat. 24 (1199 fath., temp. 2.4°) yielded of Tanaidacea 12, of Isopoda 15, but of Cumacea only 6 species. The extremely rich Stat. 36 (1435 fath., temp. 1.5°), at which only a rather small quantity of bottom material was hauled up, yielded 11 species of Tanaidacea, 18 species of Isopoda living at the bottom (besides 2 bathypelagic species) and 9 species of Cumacea, thus a proportionately good number of the last-named order. From Stat. 25, 582 fath., temp. 3.3°, thus more moderate depth, I had 8 species of Tanaidacea, 16 species of Isopoda, and 11 species of Cumacea. But while all the stations now mentioned were the only places really rich as to Tanaidacea and Isopoda, only two among them, viz. Stat. 36 and Stat. 25, contained a good representation of Cumacea, and from the last-named station with its 582 fathoms the harvest was richer than from Stat.

36, 1435 fath. But three other places, which have rather moderate depths and yielded lower numbers of Tanaidacea and Isopoda than the deeper stations just enumerated, gave the richest harvest of Cumacea. The places in question are "Ingolf" Stat. 32, 318 fath. (temp. 3.9°), with 12 species, the "Thor" at Lat. 61°07' N., Long. 9°30' W., 443 fath., with 13 species, and at Lat. 61°15' N., Long. 9°35' W., 463—515 fath., with even 15 species, thus only a little less than one-fourth of the total number of species in the area.

As only rather few species of Cumacea are restricted to depths from a few and down to 50—60 fathoms, the majority live most frequently or always in considerable depths, while only 15 species (2 among them only taken by the "Valorous") have been found in depths from 1000 to 1870 fathoms, and only 10 of these are known exclusively from these depths; 8 of these 10 species are new to science.

Of Tanaidacea the "Thor" secured only a few species, of Isopoda scarcely[1]; of all species known from the area, but of Cumacea 33 species, half of the whole number known from our area, while the "Ingolf" had only somewhat more, viz. 41 species. The geographical and bathymetrical distribution of the species of Cumacea helps somewhat to understand that remarkable fact. Many of the "Ingolf" stations are in the cold area, which has a very poor fauna of this order. Furthermore stations with the depth exceeding 600 fathoms yielded, with a single exception, a comparatively considerably or much lower number of Cumacea than of Tanaidacea and Isopoda. The highest number of species was taken both by the "Ingolf" and the "Thor" at places with depths between 300 and 600 fathoms; finally the bottom of the two above-named places, where the "Thor" gathered the very high number of Cumacea, must be especially fit for animals of this order.

Family Bodotriidæ.

Of this rich family, which is widely distributed in warmer temperate and in tropical seas, only two genera have been found in the "Ingolf" area.

Cyclaspis G. O. Sars.

The single European species of this large genus occurs in the southern part of our area.

1. Cyclaspis longicaudata G. O. Sars.

1865. *Cyclaspis longicaudata* G. O. Sars, Forh. Vid. Selsk. i Christiania for 1864, p. 207.
1896. — — Bonnier, Ann. Univ. Lyon, T. XXVI, p. 534, Pl. XXVIII, fig. 2a—2v.
!1899. — — G. O. Sars, Account, III, p. 16, Pls. VII—VIII.
1913. — — Stebbing, Das Tierreich, 39. Lief., p. 30.

Bonnier has described and figured the sculpture on the carapace, but did not perceive that many of the so-called "cellules" have at the middle a more or less elevated granule. — A feature, which seems to have been overlooked by authors, is that in females and immature males (adult males are unknown to me) the distal part of the upper margin of the peduncle of the uropods has 3 or 4 saw-teeth.

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

South of Iceland: Stat. 40: Lat. 62°00' N., Long. 21°36' W., 845 fath., temp. 3.3°; 2 immature females.

Besides, this species has been captured by the "Thor" at two places.

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 31 specimens.

— — — Lat. 61° 7' N., Long. 9°30' W., 443 fath.; large number of specimens.

Distribution. G. O. Sars says that this fine species has been gathered at several places on the west coast of Norway, northwards to off the Lofoten Islands, and always in depths of more than 100 fathoms. By the "Thor" it has been secured in the northern part of the North Sea at Lat. 58°32' N., Long. 4°18' E., 148 fath. Calman records it from places west of Ireland, 112 to 454 fath.; Norman from the North Atlantic at Lat. 56°11' N., Long. 37°41' W., 1450 fath., and from off the Spanish coast, Lat. 48°6' N., Long. 9°18' W., 539 fath.; Bonnier described a specimen from the Bay of Biscay, 510 fath. Furthermore it has been taken in the Mediterranean near Capri in depths from 65 to 584 fath. (Lo Bianco, Calman), and East of Sardinia, 652 fath. (Stephensen). Finally it has been taken in the North-West Atlantic off the United States between Lat. 39°54' and 38°22' N. in depths from 1525 to 1825 fath. (Calman).

Bathycuma H. J. Hansen.

Only one species is known from the area.

2. Bathycuma brevirostris Norman.

1879. *Leucon brevirostris*, A. M. Norman, Ann. Mag. Nat. Hist. 5. ser. Vol. III, p. 71.

!1896. *Vaunthompsonia coeca* Bonnier, Ann. Univ. Lyon. T. XXVI, p. 536, Pl. XXVIII, figs. 3a—3s.

1905. *Bathycuma brevirostris* Calman, Fisheries, Ireland, Sci. Invest. 1904, I, p. 18.

1913. — *brevirostre*, Stebbing, Das Tierreich, 39. Lief. p. 13.

My three specimens are all mutilated; thus only a single uropod is present. The serration at the median line of the carapace shows the difference pointed out by Bonnier between the female and the immature male, as in the female the posterior two-fifths of the median line have some, in my specimen 4, teeth, placed with irregular intervals, but these teeth are wanting in the young males.

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

South of Iceland: Stat. 40: Lat. 62°00' N., Long. 21°36' W., 845 fath., temp. 3.3°; 1 immature male.

Besides, this species has been taken by the "Thor" at a single place.

South of Iceland: Lat. 62°57' N., Long. 19°58' W., 508 fath.; 1 adult female and 1 immature male.

Distribution. Norman's type was taken to the south of Rockall, Lat. 56°26' N., Long. 14°28' W., 109 fath.; Calman records it from west of Ireland, 382 fath.; Bonnier from three places in the Bay of Biscay, with the depths from 133 to 908 fath. Finally it has been taken near Capri in depths from 504 to 584 fath. (Calman).

Family Leuconidæ.

As to geographical distribution this moderately large family is extremely different from the Bodotriidæ. While, as pointed out by Zimmer, the latter family has a greater number of forms in the tropical than in the northern or southern temperate seas, and only a couple of representatives, both deep-sea forms, within the "Ingolf" area, no member of the Leuconidæ has been found in the tropical seas, while a rather good number of forms inhabit the boreal-arctic and the subantarctic and antarctic seas. Three well-known genera are represented in the "Ingolf" area.

Leucon Kröyer.

Of this genus the "Ingolf" and the "Thor" together has secured a large number of forms, viz. all species taken in the area in question by earlier expeditions excepting *L. longirostris* G. O. Sars, furthermore all species captured according to Sars at Norway and according to Calman at Great Britain and Ireland, finally 5 new species. The result is that no less than 14 species (*L. longirostris* G. O. S. included) are known from our area, an astonishingly high number of this genus. A few species are found in rather low water or in moderate depths; several are mainly from depths between 200 and 600 fathoms, and some are real deep-sea forms.

The following arrangement, though partly somewhat artificial, may be of some use for the student of this somewhat difficult genus.

A. Species with an extremely long, freely projecting branchial siphon.

3. Leucon siphonatus Calm.

1905. *Leucon siphonatus* Calman, Fisheries, Ireland, Sci. Invest. 1904, I, p. 19, Pl. I, figs. 2–4.
1906. — — Calman, Mitth. Zool. Stat. Neapel, 17. Bd. 4. Heft, p. 416, Pl. 27, fig. 9.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 64.

The single specimen is a female with marsupium, 3.7 mm. long. It agrees on the whole well with Calman's description and figures; especially the somewhat curved pseudorostrum with its very concave lower margin is most characteristic. On the anterior part of one of the sides of the carapace I have counted at least 16 teeth. More than the anterior half of the lower margin of the carapace is serrated, but most of the teeth are difficult to see because they are almost subparallel with the margin. Pseudorostrum has 5 teeth on the upper margin, but the single tooth anteriorly on the dorsal crest in Calman's Irish specimen does not exist in my specimen. The upper part of the anterior margin of third free thoracic segment has several fine teeth, but no armature could be perceived on any of the other segments. In the antennulæ the third joint of the peduncle is nearly as long, but only half as thick, as the second; it is nearly half as long again as the external flagellum. In second pair of legs the merus is very thick and short, the carpus very slender and elongated, almost twice as long as the merus and a little longer than the two distal joints combined.

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

West of Iceland: Stat. 8: Lat. 63°56′ N., Long. 24°40′ W., 136 fath., temp. 6.0°; 1 specimen.

Distribution. The type was secured West of Ireland in 382 fath. (Calman).

Besides gathered at several places near Capri in depths from 53 to 584 fath. (Calman).

4. **Leucon spinulosus** n. sp.

(Pl. I, figs. 1a—1d.)

Female (with marsupium). Carapace moderately oblong (fig. 1 a), with pseudorostrum not included about one-third as long again as deep, and about as long as the free segments combined; when the pseudorostrum is included the carapace is a little less than twice as long as deep. The serration on the dorsal edge is found only on its anterior third or fourth; as a rule 3 rather long teeth are seen in front, then comes an interruption, and behind it 2 to 5 small teeth; a few teeth are found on each side between the antennal notch and the frontal lobe; the latter has no lateral tooth (fig. 1 b). Pseudorostrum is rather long, somewhat less than half as long as the carapace, more than twice as long as deep at the base, and very moderately upturned, with the proximal part of the upper margin a little convex; about the proximal half of its upper side has 4 to 7 teeth, but these show much individual variation in size, being sometimes all long, sometimes rather or very small, or some large and others small. The lower margin of the pseudorostrum is oblique but not concave as in *L. siphonatus* Calm., with a couple of smaller teeth near the middle. The antennal notch is very distinct and varies in shape, generally with a small tooth on its upper margin; the front margin above the notch generally with 2 or 3 long teeth and above them frequently 2 small teeth. The lower margin of the carapace is serrated in nearly its whole length, and the anterior teeth are long and strong; in front the margin curves upwards to the antennal notch, below which a good-sized tooth is seen, while the tooth on the middle of the curvature is also large.

Second and third free segments each with the anterior margin down to the middle of the sides armed with irregular, somewhat small teeth; furthermore the upper front angle of first segment has a couple of teeth; the upper margin of fourth segment with 2 teeth; finally 2 teeth just above the coxa of third leg on the anterior margin of the segment, and a single tooth far downwards on the front margin of second segment; in immature specimens some or many of the teeth on the free segments are apparently wanting. Abdomen slender and decidedly longer than cephalothorax with pseudorostrum.

The branchial siphon is almost or fully as long as the free thoracic segments combined. The antennulæ (fig. 1 a) are well developed; second joint of the peduncle twice as thick as, and slightly longer than, third joint, which is as long as the outer flagellum, while the inner flagellum is about as long as first joint of the outer. (First pair of legs mutilated in my specimens). Second pair of legs (fig. 1 c) most characteristic; the carpus is slender and very long, three times as long as the thick merus and considerably longer than the two distal joints combined; the terminal joint is very slender, with some very long setæ at the end. — The uropods are rather long, somewhat longer than the two distal abdominal segments combined; the peduncle in the adults a little longer, in younger specimens (fig. 1 d) a little shorter, than first joint of the endopod, with only 2 spines on the inner margin; first joint of the endopod a little more than two and a half times as long as second joint, with about 4 spines on the inner margin; second joint has a single long spine and about 5 minute spines on the inner margin, a long and thick spine and an extremely long seta on the end; exopod a little or somewhat shorter than the endopod, with very few setæ excepting some at or near the distal end.

Length of a female with marsupium from Stat. 24 3.8 mm., of an ovigerous female from Stat. 36 4.1 mm.

Remarks. This species is allied to *L. siphonatus* Calm., but differs in several particulars. Pseudorostrum is considerably longer and scarcely curved, the dorsal edge and the anterior margin of the carapace have more teeth, some of the thoracic segments have marginal teeth, in second thoracic legs the carpus is still more elongated than in *L. siphonatus*, while in the uropods the endopod is conspicuously longer than the exopod. — The rather mutilated adult female from the cold area differs from the specimens from the warm area only in having 5 instead of 2 or 3 small teeth on the dorsal edge of the carapace behind the interruption. — It may be noted that many of the teeth, f. instance on the lower margin of the carapace, are frequently difficult to count.

Occurrence. Taken by the "Ingolf" at three deep-sea stations in the warm and one station in the cold area.

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 1 small specimen.
— — Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2.4°; 5 specimens (1 adult ♀).
— — Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1.5°; 2 specimens (1 adult ♀).
South of Jan Mayen: Stat. 117: Lat. 69°13′ N., Long. 8°23′ W., 1003 fath., temp. ÷1.0°; 2 specimens (1 adult ♀).

B. Species with the branchial siphon reaching at most a little beyond pseudorostrum.

a. Endopod of the uropods longer than, or at least about as long as, the exopod.

5. Leucon tener n. sp.

(Pl. I, figs. 2a—2c.)

Female (with marsupium). Carapace oblong, half as long again as deep, and when pseudorostrum is included twice as long as deep, about as long as the free segments combined. The serration on the dorsal edge occupies only about its anterior third, and in this third even a long interruption is found, as two teeth are seen anteriorly, then comes a smooth part and behind it 3 or 4 teeth. Pseudorostrum is considerably upturned, long, nearly $^{2}/_{5}$ of the whole length of the carapace, with the narrow end obtuse and the upper margin slightly concave, while the lower margin is nearly straight and has two saw-teeth a little before the base of the antennulæ. The frontal lobe on each side with two teeth, one towards the dorsal edge, the other a little above the lower margin. The antennal notch is feebly developed, as the antero-lateral corner of the carapace is slightly produced, terminating in a small tooth, above which two minor teeth are seen; the lower margin has only about three teeth. The abdomen is somewhat slender, a little shorter than the cephalothorax with pseudorostrum.

The antennulæ, when stretched horizontally forwards, with the tip of the outer flagellum scarcely reaching below the apex of pseudorostrum; second joint of the peduncle is curved, thick, considerably thicker than third joint; the outer 3-jointed flagellum is very considerably longer than third joint of the peduncle, and its first joint is as long as its two distal joints combined; inner flagellum uncommonly long, even a little longer than first joint of the outer flagellum. — First pair of legs (fig. 2 b) without teeth on the lower side of second joint; sixth joint scarcely longer than the fifth and much longer than the seventh. Second pair of legs with the carpus in the adult conspicuously, in an immature specimen slightly, longer than the two distal joints combined. — Uropods (fig. 2 c) rather characteristic; the peduncle as long as the exopod, with about 4 spines on the inner margin; second joint of the exopod with 3 setæ along the outer margin, the usual long setæ on the distal part of the inner margin and on the end, and besides 3 well developed setæ on the upper surface; endopod somewhat longer than the exopod; its first joint two and a half times as long as the second, with 4 spines (in an immature specimen with 6 spines) at the inner margin, and the spine at its end is rather long and thick; second joint with two spines near the end, the second long and strong, and besides with an extremely long terminal spine.

Length of the female with marsupium 4.4 mm.

Remarks. This small species is instantly recognized by the long pseudorostrum, the very few dorsal saw-teeth on the carapace, two pairs of teeth on the frontal lobe, and the rami of the uropods. In the two first-named features it shows relationsship to *L. spiniventris* n. sp., but the latter is much larger and differs from *L. tener* in several sharply pronounced features.

Occurrence. The "Ingolf" has gathered this species at three rather deep stations in the warm area.

Davis Strait: Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 1 adult female.

Denmark Strait: Stat. 97: Lat. 65°28′ N., Long. 27°39′ W., 450 fath., temp. 5.5°; 1 immature female.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4.5°; 1 young specimen.

6. **Leucon longirostris** G. O. Sars.

!1871. *Leucon longirostris* G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Följd. B. 9, No. 13, p. 42, Tafl. XV, fig. 75.

1879. — — Norman, Ann. Mag. Nat. Hist. 5 ser., Vol. III, p. 69.

!1906. — — Calman, Mitth. Zool. Stat. Neapel B. 17, p. 414, Pl. 27, figs. 1—8.

1913. — — Stebbing, Das Tierreich, 39. Lief., p. 70.

Occurrence. Of this characteristic species I have not seen any specimen, but it has been recorded by Norman (l. c.) from a deep-sea station at the entrance of Davis Strait: Lat. 59°10′ N., Long. 50°25′ W., 1750 fath.

Distribution. The type was taken off Portugal at Lat. 38° 7′ N., Long. 9° 18′ W., 550 fath. (G. O. Sars). Calman recorded it from a place off the Un. States, Lat. 40° 16′ 50″ N., Long. 67° 05′ 15″ W., 1290 fath., and from stations in the Mediterranean near Capri, 504 to 637 fath.

7. **Leucon spiniventris** n. sp.

(Pl. I, figs. 3a—3d).

Female (adult and subadult). Allied to *L. longirostris* G. O. S., but very distinct. Carapace with pseudorostrum about 4 times in total length; more than the posterior half of the dorsal crest is feebly curved, nearly horizontal, while its anterior part curves gradually considerably downwards and is armed with 2 triangular teeth very distant from one another, and the anterior somewhat behind the end of the frontal lobe; the anterior tooth is moderately large, the posterior one considerably larger; the lateral surface of the frontal lobe without any tooth. Pseudorostrum is a little more than 1/4 of the total length of the carapace, directed considerably upwards and tapering from near the base to the subacute end; its upper margin has the posterior half a little concave, while the lower margin has towards the base 2 distinct teeth and 1 rudimentary tooth. The antennal notch is regularly and somewhat flatly concave without any incision or tooth. The antero-lateral angle of the carapace is slightly produced and equipped with a strong tooth, behind which the lower margin has about 12 teeth. The pleural plate of the antepenultimate thoracic segment has its infero-posterior angle produced into a slender tooth turning downwards; the last thoracic segment has on the anterior half of its lower side two pairs of spiniform processes (fig. 3c) directed downwards and forwards. The abdomen is rather robust and a little longer than the cephalothorax; its first segment has below a pair of procurved, spiniform teeth (fig. 3c).

The antennulæ are moderately long; second joint of the peduncle is very thick, third joint much more slender, through still robust. The outer flagellum 3-jointed; first joint almost as long as the third joint of the peduncle, and distinctly longer than second joint; the inner flagellum is a rather thick, subconical joint with the end obtuse, and it is somewhat shorter than first joint of the outer flagellum. Third maxillipeds without any conspicuous tooth on fourth or fifth joint. First thoracic legs without teeth on the lower side of second joint; the propodus is a little longer than the carpus and considerably longer than the terminal joint. Second legs with the distal joints very robust; carpus nearly as long as the two following joints combined. Fourth legs at least in the immature female (fig. 3e) with a spine directed forwards and somewhat upwards on the antero-interior side of second joint somewhat from its base. — The uropods (fig. 3d) are a little shorter than the two distal abdominal segments combined. The peduncle in the adult with about 7 spines on its inner margin. The endopod is as long as the peduncle; its proximal joint at least five times as long as the distal joint which terminates in a strong, somewhat curved spine longer than the joint; this distal joint has 4 or 5 spines on its inner margin, while the proximal joint has in the adult about 17 spines; among the 8 spines on its distal fourth 3 are long and strong, while 5 are rather short; in the immature specimen 14 or 15 spines were observed on the proximal joint. The exopod is considerably shorter than the endopod.

Length of a female with brood in the marsupium 7 mm.

Remarks. *L. spiniventris* is more allied to *L. longirostris* G. O. S. than to any other northern species, but it differs in several features. The dorsal edge has only 2 teeth, while *L. longirostris* has about 7; the pseudorostrum is proportionately somewhat shorter; the antennal notch without teeth; the last thoracic segment with two pairs of ventral processes, while only one pair are found in *L. longirostris*; first abdominal segment has a pair of ventral processes not found in any other species, finally the endopod of the uropods has its second joint very short, proportionately a good deal shorter than in *L. longirostris*.

Occurrence. Not taken by the "Ingolf", but by Dr. Joh. Schmidt in the middle of July 1903 at a single place.

South of Iceland: Lat. 62°57′ N., Long. 19°58′ W., 508 fath. 2 specimens.

8. **Leucon profundus** n. sp.

(Pl. I. figs. 4a—4d).

Female (with marsupium). Carapace rather oblong, without pseudorostrum a little less than half as long again as deep, and slightly shorter than the free segments combined; when the pseudorostrum is included the carapace is a little less than twice as long as deep. The serration on the dorsal edge is well developed excepting a moderately short interruption somewhat before the posterior end. The frontal lobe has on each side a good-sized tooth a little above its lower margin. Pseudorostrum rather long, a little less than one-third as long as the carapace without pseudorostrum, somewhat upturned, half as long again as deep; the upper margin is slightly concave, the lower and the terminal margins constitute together a continuous rather convex line, and the terminal margin has about 6 somewhat small teeth. The antennal notch is subangular at the bottom and rather deep, as the antero-lateral corner of the carapace is considerably produced with its upper margin finely serrated; the lower margin of the carapace has only about 7 teeth. The abdomen is moderately robust about as in *L. Nasica* Kr., and somewhat longer than carapace with pseudorostrum.

The antennulæ when stretched forwards (fig. 4b) with the peduncle long, reaching far beyond the end of pseudorostrum. Second joint of the peduncle is unusually slender, third joint longer than second and still considerably more slender; outer flagellum only half as long as third peduncular joint, with its first joint longer than the two other joints combined; inner flagellum very short. Third maxillipeds normal; fourth joint with 2 teeth, both on the distal part of its outer side, while the fifth joint has only a single tooth, situated distally on the outer margin. First pair of legs (fig. 4c) moderately robust; second joint on the distal half of the lower margin with a row of strong teeth; third joint with a tooth on the inner, and fourth joint with a tooth on the outer margin near the end; fifth joint conspicuously longer than the sixth, which is not fully twice as long as the seventh. Second pair of legs with the carpus rather long, somewhat longer than the propodus and dactylus combined. — Uropods moderately slender (fig. 4d); the peduncle a little longer than the exopod, with about 3 long and 2 short spines along the distal half of the inner margin; second joint of the exopod with a few short setæ along the outer margin, no setæ on the upper side, while the end and the distal part of the inner margin have the usual long setæ; endopod very considerably longer than the exopod, its first joint about two and a half times as long as second joint and slightly shorter than the exopod, with several — in the subadult specimen figured 8 — spines of different length on the inner margin, second joint on the inner margin and the end with about 7 spines increasing in length from the first to the last, and the outer terminal spine is almost as long as the joint.

Length of an ovigerous female 7.3 mm.

Remarks. This fine species is easily recognizable in having the carapace somewhat low in proportion to its length, pseudorostrum rather long and longer than in the majority of forms, a conspicuous tooth near the lower margin of the frontal lobe, the two distal joints of the antennular peduncles long and the outer flagellum uncommonly short in proportion to the last joint of the peduncle, finally by the uropods with the long endopod and the relative length of its joints.

Occurrence. Taken by the "Ingolf" at two deep-sea stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2.4°; 16 specimens.

— — Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 9 specimens.

(Most of the specimens from both stations not full-grown or mutilated).

9. **Leucon Nasica** Kröyer.

1841. *Cuma Nasica* Kröyer, Naturh. Tidsskr. B. III, p. 524, 532, Tab. VI, Fig. 31—33.
1846. *Leucon* — Kröyer, Naturh. Tidsskr. 2. R. B. II, p. 189, 209, Tab. II, Fig. 5, a—b.
1849. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. III, fig. 2, a—o.
!1900. — *nasicus* G. O. Sars, Account, III, p. 30, Pls. XXI—XXII.
1911. — *nasica* Stappers, Camp. arct. Duc D'Orléans, Crust. Malacost. p. 100, Pl. IV, fig. 1.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 66.

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

North-West Iceland: Dyre Fjord, 20 fath., mud; 13 specimens.

But this species has been secured at a good number of other localities within our area. Off West Greenland it has been captured at Proven (Lat. 72°23' N.), 200—300 fath., and at Nivak (Lat. 68°36' N.), 120 fath. (H. J. Hansen). The "Thor" gathered it south-west of Iceland: Lat. 63°46' N., Long. 22°56' W., 80 fath. (many hundreds of specimens), and south of Iceland: Lat. 63°18' N., Long. 21°30' W., 94 fath. Furthermore it has been taken at North-West Iceland by Mag. W. Lundbeck in Onundar Fjord, 11—12 fath., ooze with a few stones and some algæ (large number of specimens), and by Mag. R. Horring in Dyre Fjord, 10—12 fath., off North Iceland by the "Thor" near Husa Vik, 42—53 fath.; at East Iceland by Mag. R. Horring in Faskruds Fjord, 50—20 fath., and by Dr. A. C. Johansen in Loons Vik, 40 fath., ooze and clay; finally south of Iceland by Dr. A. C. Johansen at Vestman-Islands, 68—70 fath., clay and ooze.

At East Greenland *L. Nasica* has been taken two times, viz. in Hekla Havn, Lat. 70°27' N. (H. J. Hansen), and in Scoresby Sound, Lat. 70°43' N., 37 fath. (Ohlin).

Distribution. This species has a very wide distribution. It inhabits the Kattegat, especially its eastern parts, and goes southwards into the northern half of the Sound and the northern part of Store Belt and Odense Fjord; in these southern localities it has been taken in 9 fath., and even in "7—9" fath. in

Skager Rak it has been found in depths from 70 and down to 350 fath. (Meinert; H. J. Hansen). At Norway it is common along the whole coast from Christiania Fjord to Vadsø in 30—100 fath. (G. O. Sars). It has been recorded from two places at West Spitzbergen, the most northern of the stations at Lat. 78°27′ N., in 111 and 93 fath. (Ohlin); from the Murman Sea, 48 fath. (Stappers); from Matotschkin Strait, 10—15 and 30—50 fath. (Stuxberg); from the Kara Sea, 51 fath. (H. J. Hansen), and somewhat further eastwards at two places in 17 and 22 fath., the most eastern locality being at Lat. 75°00′ N., Long. 75°20′ E. (Stuxberg). At Scotland it has been secured in some places on the western side; on the eastern side in Firth of Forth, 40 to 43 fath., and more southwards off Alnmouth and Sunderland, 59 and 45 fath. (various authors); furthermore at Lat. 57°54′ N., Long. 7°38′ W., 212 fath. (by the "Thor"), and at two places in the North Sea, the most southern locality being Lat. 56°33′ N., Long. 1°47′ E., 47 fath. (by the "Thor"). Lo Bianco's statement on its occurrence in the Mediterranean is of course wrong. On the Atlantic side of America it has been recorded from Gulf of St. Lawrence, 50—70 fath. (S. I. Smith) and from two places at Labrador, one among them with 80 fath. (Calman); finally on the Pacific side from two localities on the south coast of Alaska, one among them with 6—8 fath. (Calman).

10. **Leucon Nathorstii** Ohlin.

(Pl. I, figs. 5a—5b.)

1901. *Leucon Nathorsti* Ohlin, Bih. till K. Sv. Vet. Akad. Handl. B. 26, IV, No. 12, p. 41, figs. 9a—9c.
1913. — *nathorsti* Stebbing, Das Tierreich, 39. Lief. p. 68.

Some additions, together with two figures, may be made to Ohlin's brief description. My numerous specimens are rather small; a female with marsupium from Jan Mayen measures only 4.5 mm in length, while Ohlin says 7 mm. Pseudorostrum is not quite as long as figured by Ohlin, and shaped about as in *L. fulvus* G. O. S. The frontal lobe has always a single and distinct, acute tooth on each side; I have inspected more than thirty specimens from Jan Mayen and every specimen from the other localities without finding any exception. When the antennulæ are in a horizontal direction their peduncle terminates vertically below the end of pseudorostrum; the outer flagellum is as long as the terminal joint of the peduncle, and its first joint is considerably longer than the two other joints together. Third maxillipeds on the proximal two-thirds of the lower side of second joint with a longitudinal row of small, feeble teeth; fourth and fifth joints each with 2 spiniform teeth on the outer margin and 1 tooth distally on the lower side. First pair of legs (fig. 5 a) rather slender; second joint with only two spines very remote from one another on the lower side; fourth joint without any distal tooth on the outer margin; sixth joint a little shorter than fifth and much longer than seventh. Second legs with the terminal joint nearly as long as the carpus. Fig. 5b exhibits the left uropod of an adult female; it is seen that the endopod is conspicuously longer than the exopod, and its proximal joint a little more than twice as long as the distal; the number and relative length of the spines scarcely need any description.

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

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 6 specimens.

North of Iceland: Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0.5°; 5 specimens.

The IInd Amdrup-Expedition has secured this species at two places.

Jan Mayen, 50—60 fath., and 55 fath.; 46 specimens.

East Greenland: North of Steward Land (ab. Lat. 70°30' N.), 158 fath., clay with stones; 1 specimen.

Distribution. Ohlin's specimens were taken at three stations at King Charles Island, Spitzbergen, viz. in Bremer Sound, 53—58 fath., temp. ÷ 1.45°, at Lat. 78°50' N., Long. 27°30' E., 10 fath., temp. 0.2°, and at Lat. 78°50' N., Long. 29°30' E., 32—37 fath.; furthermore it is recorded from a place at East Spitzbergen, 45 fath., and from a locality north of Spitzbergen at Lat. 81°20' N., 530 fath. (Zimmer, in 1908). Stappers recorded 3 specimens from two hauls taken near one another south of Novaya Zemlya, Lat. 70°20' N., Long. 56°35' E. and 56°34' E., 48 fath.

11. **Leucon nasicoides** Lilljeb.

1855.	*Leucon*	*nasicoides*	Lilljeborg, Öfv. K. Sv. Vet. Akad. Förhandl. B. 12, p. 122.
!1900.	—	—	G. O. Sars, Account, III, p. 31, Pl. XXIII.
1911.	—	—	Stappers, Camp. arct. Duc D'Orléans, Crust. Malacost. p. 102, Pl. IV, fig. 7.
1913.	—	—	Stebbing, Das Tierreich, 39. Lief., p. 65.

Occurrence. Not taken by the "Ingolf", but captured by several other expeditions or collectors at various places within our area.

At West-Greenland it was known from Kekertak, Lat. 69°58' N., 40 fath., and Godhavn, Lat. 69°14' N. (H. J. Hansen); by Traustedt it has been gathered at Holstensborg, Lat. 66°56' N. It is not known from the northern, western or southern side of Iceland, but at East-Iceland it has been taken at four places, viz. in Bakke Fjord, 52—43 fath. ("Diana", by Dr. A. C. Johansen), Viid Fjord, 8—12 fath. (by Mag. R. Hørring), Faskruds Fjord, 50—20 fath., blue clay (by Mag. R. Hørring), and Breiddals Vik, 6 fath., mud and black sand, about 200 specimens (by Dr. A. C. Johansen). Off East Greenland it has been taken by the IInd Amdrup-Expedition at Cape Dalton, Lat. ca. 69°30' N., 9—11 fath., 1 specimen, and it has been recorded from Hekla Havn, Lat. 70°27' N., 10 fath. (H. J. Hansen), and from S. of Little Pendulum Island, Lat. 74°35' N., Long. 18°23' W., 9—12 fath. (Ohlin).

Distribution. *L. nasicoides* has been recorded from the southern part of Kattegat, 14½ to 20 fath., the Samsø Belt, 7 and 11 fath., and the northern part of the Sound, 16 fath., furthermore from Skager Rak, 110 and 125 fath. (H. J. Hansen). At Norway it has been found in several localities from Christianiafjord to Lofoten, 10 to 50 fath., and at Hammerfest (G. O. Sars). Stappers recorded a good number of specimens from two hauls taken near one another south of Novaya Zemlya, Lat. 70°20' N., Long. 56°35' and 56°34' E., 48 fath. Off North America it has been recorded from the Gulf of St. Lawrence and from Eastport in the Bay of Fundy (S. I. Smith), finally from Lat. 45°29' N., Long. 55°24' W., 67 fath. (Calman). — Stebbing (l. c.) has among the localities "Spitzbergen", depth 1000 m., his authority is certainly Zimmer in "Fauna arctica", but he has overlooked that the last-named author in his Cumacea from the German "Tiefsee-Expedition", 1908, p. 178, says that the specimens from Spitzbergen determined by him in 1900 as *L. nasicoides* in reality belong to *L. Nathorstii*.

b. **Endopod of the uropods distinctly or considerably shorter than the exopod.**

12. **Leucon fulvus** G. O. Sars.

1865. *Leucon fulvus* G. O. Sars, Forh. Vid. Selsk. Christiania for 1864, p. 180.
!1900. — — G. O. Sars, Account, III, p. 32, Pl. XXIV.
1911. — — Stappers, Camp. arct. Duc D'Orléans, Crust. Malacost. p. 105, Pl. IV, fig. 8.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 66.

This species was, according to Sars and Stappers, known only from depths between 6 and 50 fathoms, thus a pronounced shallow-water form. The following list of localities shows nearly every desirable depth between 10 and 582 fathoms, and even that a couple of specimens from nearly 1200 fath. are referred to this species. I have spent a good deal of time in search for any reliable character, by which it would be possible to refer the specimens from more than 50 or 100 fathoms to another species, but without result. In the carapace, the antennulæ, the thoracic legs of first and second pairs, and the uropods some variation in minute particulars could be found, but no real difference indicating the possibility of dividing the form into two species. Only one feature may be noted, viz. that the 2 specimens from Stat. 35, 362 fath., 4 of the 5 specimens from Stat. 25, 582 fath., and the majority of, but not all, specimens from Stat. 32, 318 fath., have some or several saw-teeth on the dorsal edge of first and second free thoracic segments, while such teeth are absent in the 2 specimens from Stat. 28, 420 fath., the 2 specimens from Stat. 126, 293 fath., the 2 young males from Stat. 24, 1199 fath., and in specimens from all places with the depth less than 200 fath. The existence of such dorsal teeth on the anterior thoracic segments is consequently to be regarded as variation in specimens from considerable depth.

It may be mentioned that second joint of the exopod in the uropods is always at least rather long, but frequently not as long in proportion to first joint as shown by Sars. Stappers states that he has found 4 lanceolate appendages on the ischium of third pair of thoracic legs in the adult males, and that these appendages are shorter than in the other boreal or arctic forms examined by him; this observation agrees completely with males from Önundar Fjord examined by me, and it is mentioned here, because G. O. Sars in 1865 has another statement and in 1900 a third statement, both consequently wrong.

Occurrence. Taken by the "Ingolf" at 8 stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 9 specimens.
— — Stat. 31: Lat. 66°35′ N., Long. 55°54′ W., 88 fath., temp. 1.6°; 4 specimens.
— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3.6°; 2 specimens.
— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; 2 specimens.
— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 5 specimens.
— — Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2.4°; 2 specimens (immature males).

North of Iceland: Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0.6°; 24 specimens.
— — — Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0.5°; 2 specimens.

The "Thor" gathered *L. fulvus* south-west of Iceland Lat. 63°46' N., Long. 22°56' W., 80 fath. Furthermore it has been taken west of Iceland in Faxe Bugt off Kolla Fjord, 10 fath., at North-West Iceland by the "Thor" and by Mag. W. Lundbeck in Onundar Fjord, 10 fath. and 11—12 fath., at North Iceland in Skjalfandi, 21 fath. (by "Beskytteren"), finally recorded by G. O. Sars from the harbour of Reykjavik, South Iceland.

Distribution. At Norway it is recorded from the Lofoten islands, 6—12 fathoms, and from "several places of the Finmark coast, as far east as Vardø" (G. O. Sars). Furthermore it has been taken in Advent Bay, Spitzbergen (G. O. Sars), and Stappers recorded numerous specimens from two hauls taken near one another south of Novaya Zemlya, Lat. 70°20' N., Long. 56°33' and 56°34' E., 48 fath. — Lo Bianco recorded it erroneously from the Mediterranean.

13. **Leucon acutirostris** G. O. Sars.

1865. *Leucon acutirostris* G. O. Sars, Forh. Vid. Selsk. Christiania for 1864, p. 181.
!1900. — — G. O. Sars, Account, III, p. 34, Pl. XXVI.
1911. — — Stappers, Camp. arct. Duc D'Orléans, Crust. Malac. p. 107, Pl. IV, fig. 10.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 73.

Occurrence. Taken by the "Ingolf" at 5 places:

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fath., temp. 3.9°; 38 specimens.
— — Stat. 28: Lat. 65°14' N., Long. 55°42' W., 420 fath., temp. 3.5°; 19 specimens.
— — Stat. 27: Lat. 64°54' N., Long. 55°10' W., 393 fath., temp. 3.8°; 2 specimens.
— — Ameragdla (inner end of Ameralik Fjord), Lat. 64°12' N.; 1 specimen.
— — Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fath., temp. 3.3°; 26 specimens.

Distribution. Taken several times in eastern Kattegat southwards to off Kullen, 16 to 44 fath. (H. J. Hansen), and three times in Skager Rak, 70—125 fath. (Meinert). According to Sars it has been taken in many places along the Norwegian coast from the inner part of Christiania Fjord, 30—60 fath., to Vadsø, besides Sars recorded it from 200 fath. in Christiania Fjord, and Norman from 150 to 300 fath. in Throndhjem Fjord. Finally Stappers recorded several specimens as taken south of Novaya Zemlya, in 48 fath., together with *L. nasicoides*, *L. Nathorstii*, *L. fulvus* and *L. pallidus*.

14. **Leucon pallidus** G. O. Sars.

1865. *Leucon pallidus* G. O. Sars, Forh. Vid. Selsk. Christiania for 1864, p. 182.
1873. — — G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Föjld. B. 11, no 6, p. 9, Tafl. III, Fig. 10.
!1900. — — G. O. Sars, Account, III, p. 33, Pl. XXV.
1911. — — Stappers, Camp. arct. Duc D'Orléans, Crust. Malac. p. 106, Pl. IV, fig. 9.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 71.

Sars says in 1900: "Dorsal crest very fully developed, extending to the hind edge," but the crest has always a short part somewhat before the hind margin without serration, as shown in his fig. C and in his fig. 10 in the paper from 1873. In female specimens from 10 and 6 fathoms the pseudorostrum is a little shorter and more obtuse than in specimens from deeper water, but the endopod of the uropods is normal; it may be added that in some of those specimens this endopod is scarcely as short in proportion to the exopod as in typical specimens.

Occurrence. — Taken by the "Ingolf" at 4 stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; ab. 44 specimens, some among them males.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 5 specimens.

West of Iceland: Stat. 8: Lat. 63°56′ N., Long. 24°40′ W., 136 fath., temp. 6.0°; 1 specimen.

Near Jan Mayen: Stat. 115: Lat. 70°50′ N., Long. 8°29′ W., 86 fath., temp. 0.1°; 1 specimen.

Furthermore it has been gathered by "Beskytteren" in two places at North Iceland, viz. in Skjalfandi, 10 fath., 2 specimens, and in Thorshøfn, 6 fath., 2 specimens; at East Iceland it has been secured by the "Thor" in Hjerads Floi, 28—47 fath., 2 specimens, and by Dr. A. C. Johansen in Breiddals Vik, 10 fath., sand, 1 specimen.

Distribution. — *L. pallidus* is known from two localities in Skager Rak, 125 and 350 fath., (H. J. Hansen). At Norway it has been taken in Christiania Fjord, 50 to 230 fath., and in Hardanger Fjord, 150 to 400 fath. (Sars); in Throndhjem Fjord, 40 to 300 fath. (Norman), and at Lofoten, 300 fath.; the "Thor" captured it south-west of Norway at Lat. 58°32′ N., Long. 4°18′ E., 149 fath. Furthermore it has been taken south of Spitzbergen at Lat. 76°5′ N., Long. 13°5′ E., 1400 fath., and at Lat. 76°19′ N., Long. 18°1′ E., 146 fath. (G. O. Sars). Stappers recorded many specimens as taken south of Novaya Zemlya, in 48 fath., together with *L. nasicoides*, *L. Nathorstii*, *L. fulvus* and *L. acutirostris*, and 2 specimens from the western part of the Kara Sea, at Lat. 71°26′ N., Long. 56°29′ E., captured in a vertical haul from the bottom, 200 met. to 150 met. — Calman recorded (1905) with a query a few immature and damaged specimens gathered west of Ireland in 382 fath.; his observation, that they possessed "on either side of the cephalic lobe, just above the end of the lateral fissure, a small, inconspicuous denticle, sometimes two", makes the determination rather uncertain.

15. **Leucon serratus** Norman.

(Pl. I, figs. 6a—6e).

1876. *Leucon serratus* Norman, Proc. Royal Soc. Vol. XXV, p. 212 (nomen nudum).
1879. — — Norman, Ann. Mag. Nat. Hist. Ser. 5, Vol. III, p. 70.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 72.

Female (and immature Male). In general aspect intermediate between *L. fulvus* and *L. acutirostris*. In the ovigerous female the length of the carapace without pseudorostrum is in proportion to the free segments combined as 62:54; the length of the carapace in proportion to the depth is as 49:36. The dorsal edge serrated excepting on a short part considerably before the posterior end (in Norman's type the serration is not interrupted). Frontal lobe without any lateral spine. Pseudorostrum feebly upturned, of very moderate length, with its terminal portion somewhat deep, as its terminal margin is rather long, subvertical or somewhat feebly oblique, with 6 or 7 teeth. Antero-lateral corner of the carapace much produced, so that the antennal notch is deep and the terminal tooth on the corner long and strong; the lower margin of the notch with a couple of minute teeth. The lower margin of the carapace in my adult female with about 10 teeth. The abdomen is moderately slender, about as long as cephalothorax without pseudorostrum.

The antennulæ are very short (figs. 6a—6b); in horizontal position their end is vertically below the apex of pseudorostrum; second joint of their peduncle is very thick and distinctly longer than third joint, which is rather robust and a little longer than the outer flagellum; the inner flagellum is short. Third maxillipeds (fig. 6c) with a row of small teeth on somewhat less than the proximal half of lower side of second joint; fourth joint, the merus, seen from below with 3 strong, acute teeth at the terminal margin, and one large, acute tooth distally on the outer margin; carpus with two slender teeth on the outer margin and one tooth on the lower side at the end. First pair of legs cannot be fully described, because only a single leg was moderately preserved, while the other five legs in the 3 specimens had lost their distal half; in an immature male the second joint has a longitudinal row of 6 very strong, oblong teeth on the distal part of the lower side, while in the adult female (fig. 6d) only 3 real and rather feeble teeth are found; in the last-named specimen the distal half of the leg was uncommonly slender and its dactylus as long as the propodus, but somewhat shorter than the carpus. Second pair of legs with the dactylus as long as the carpus. — The uropods (fig. 6e) have the peduncle slightly shorter than the exopod, with about 4 spines along the inner margin; the exopod has 3 shorter setæ on the proximal part of the outer margin of second joint, while the end and the distal part of the inner margin possess the usual long setæ; the endopod is much shorter than the exopod; its first joint, which is nearly half as long again as the second, has 5 or 6 spines at the inner margin and one long spine at its end; second joint with 4 spines on the inner margin and 2 terminal spines, the outer as long as, or somewhat shorter than, the joint.

Length of an ovigerous female 4.9 mm.

Remarks. Norman established his *L. serratus* on a single female specimen measuring 6 mm. in length, thus somewhat larger than the single adult female examined by me. His description was published as early as in 1879, without figures, and though seemingly good has its defects. Thus the relative dimensions of the carapace stated by him had scarcely been measured with a micrometer and are therefore not accurate, as I do not think the depth of the carapace is "subequal" to its length in any species of *Leucon*. Furthermore his expression on the carapace: "antero-lateral corner produced forwards and outwards in wing-like form" is certainly somewhat unfortunate. In order to remove these and other difficulties as to the determination of my specimens I wrote to my able and always very helpful friend Dr. W. T. Calman, asking him to examine Norman's type preserved in the British Museum (Natural History) as to certain points, and I enclosed calkings of my figures for comparison. He answered the questions and added sketches of the carapace, of first leg and of an uropod. He says that "the antero-lateral angle of the carapace is not conspicuously everted", and "there is no tooth on the side of the frontal lobe", an important character. His sketch of the carapace shows that the dorsal edge of the type is somewhat more convex towards the middle, so that the carapace is distinctly shorter in proportion to length than in my adult female, though without pseudorostrum decidedly more than one-fourth as long again as deep; furthermore he figures only 4 teeth on the lower margin of the carapace.

and pseudorostrum is a little shorter than in my specimen, but I do not think that these differences are of specific value. On the third maxillipeds he says: "I can see four teeth on the merus and, I think, three on the carpus"; this statement is very important, as the number of teeth agrees completely with my description, and both the joints mentioned have a higher number of such teeth than in any other species of *Leucon* described in the present paper, and are, besides, unusually robust. He observed 7 strong teeth on second joint of first leg, but as I found 6 in an immature male the difference is of no importance; in my adult specimen the first leg has a curiously week aspect, was perhaps not quite normal, and therefore the low number of 3 teeth on the lower side of second joint is not improbably a casual anomaly. Calman's sketch of the uropods shows the same difference as to length between exopod and endopod, furthermore that second joint of the endopod is even slightly longer in proportion to first joint than in my fig. 6e; a difference as to spines on the inner margin of first joint of the exopod is easily explained by the supposition that one spine or perhaps two spines near the middle of the margin are lost in Norman's type. His specimen was secured rather near the two places where my specimens were captured, and judging from the similarity in important characters I think that my determination is correct.

Occurrence. Taken by the "Ingolf" at two deep-sea stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2.4°; 1 ovig. female.

— — Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 2 immature males.

The type, the only specimen hitherto recorded, was gathered by the "Valorous" at the entrance of Davis Strait, Lat. 59°10' N., Long. 50°25' W., 1750 fath. (Norman).

16. **Leucon robustus** n. sp.

(Pl. I, figs. 7a—7d).

Female (with the marsupium half developed). Rather similar to *L. serratus*, but showing some sharp differences. Carapace about as deep in proportion to length as in *L. serratus*, but the anterior half of the dorsal line is less convex; the serration on the dorsal edge is strongly developed, with the usual interruption considerably before the posterior end. The frontal lobe has a longitudinal row of 3 conspicuous teeth a little above its lower margin. Pseudorostrum feebly upturned, moderately long, tapering to the acute end (fig. 7a), with the lower margin a little convex and a few teeth near the end (fig. 7b). The antennal notch is deep, angular at the bottom, with 2 or 3 minute teeth on its upper and 5 teeth on its lower margin; the antero-lateral corner therefore considerably produced; the lower margin of the carapace with about 9 teeth. The free thoracic segments combined as long as carapace without pseudorostrum. Abdomen moderately slender, as long as the whole cephalothorax.

The antennulæ (fig. 7b) are long; the peduncle is slender in proportion to length, reaching beyond the end of pseudorostrum, with third joint somewhat shorter and considerably more slender than the second; the three-jointed outer flagellum is slightly shorter than third peduncular joint; inner flagellum very short. Third maxillipeds with a single spine on the proximal part of the lower side of second joint; merus with one well developed and another minute spine at the outer margin; carpus with 2 well-sized distal spines, one below and the other on the outer margin. First pair of legs (fig. 7c) robust; second joint with 3 strong teeth on the lower side near the outer margin, merus with a distal tooth on the outer margin, carpus conspicuously longer than propodus and twice as long as dactylus. Second pair of legs with carpus somewhat elongated, distinctly longer than the two distal joints combined. — Uropods (fig. 7 d) somewhat similar to those in *L. serratus*, the peduncle is a little shorter than the exopod, with about 6 spines along the inner margin; the exopod is somewhat slender, with the normal setæ along the inner margin and on the end, and a few short setæ on the outer margin of second joint near its base; the endopod is considerably shorter than the exopod, its first joint nearly more than two and a half times as long as the second, with about 8 spines along the inner margin, and some of them long; second joint with 4 spines along the inner margin, and 2 long spines on the end, the outer somewhat longer than the inner and as long as the joint.

Length of the largest specimen, a female with the marsupium half developed, 6.1 mm.

Remarks. *L. robustus* agrees with *L. nasicoides* and differs from all other northern or European forms in having 3 pairs of teeth on the frontal lobe, but the arrangement of these teeth is sharply different in the two species. The uropods afford a good character in having the distal joint of the endopod rather short.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1.5°; 2 immature females.

Eudorella Norman.

This genus is richly represented in our area, but excepting a single species the other forms are difficult. On the following pages I have recorded 6 species, viz. *E. emarginata* Kr. and 5 species allied to *E. truncatula* Bate and *E. hirsuta* G. O. Sars, but apparently not belonging to any of these forms; 4 of the 5 species are established as new. Especially the forms with only 2 or 3 saw-teeth above the antennal notch in the female are very difficult, because, as already pointed out by Calman, there is some individual variation in the armature of the anterior margin of the carapace and in other particulars generally used as specific characters. Though my material is good, adult and subadult females ought to be collected at a much higher number of stations within the "Ingolf" area and farther south before the individual variation and the limitation of some of the species can be finally and satisfactorily decided. Meanwhile the following descriptions with figures may serve as help for a future investigator. It may only be added that there is probably a somewhat high number of species of *Eudorella*, as the allied genus *Leucon* really has numerous northern species, and in the latter genus they can as a rule be separated with certainty, while in *Eudorella* the characters are generally more difficult to discover and point out, so that at the present time the personal judgment must in some cases be applied more than desirable by the limitation of species.

17. Eudorella emarginata Kröyer.

1846. *Leucon emarginatus* Kröyer, Naturh. Tidsskr. 2. Række B. II, p. 181, 209, 211, Tab. II, Figs. 3, a—h.
1849. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. V a, fig. 2, a—s.
1900. *Eudorella emarginata* G. O. Sars, Account, III, p. 36, Pl. XXVII—XXVIII.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 75.

Occurrence. Taken by the "Ingolf" at 5 places.

Davis Strait: Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; about 15 specimens.

West Greenland: Ameragdla (inner end of Ameralik Fjord), Lat. 64°12′ N.; 9 specimens.

North-West Iceland: Dyre Fjord; 20 fath.; 12 specimens.

East Iceland: Seydis Fjord; 2 specimens.

Between Iceland and the Færoes: Stat. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fath., temp. 2.5°; 1 specimen.

Furthermore *E. emarginata* has been gathered by several expeditions or zoologists at a large number of places within the "Ingolf" area. It has been recorded from five places at West Greenland, viz. Umanak Fjord, Lat. ab. 71° N., 410 fath.; Claushavn, Lat. 69°05′ N., 280 fath., and Nivak, Lat. 68°36′ N., 120 fath. (H. J. Hansen); in Nordre Strømfjord, Lat. 67°40′ N., Long. 52°38′ W., 202—191 fath., temp. ÷ 1.5° (K. Stephensen); finally Julianehaab, Lat. 60°43′ N., 30 fath. (H. J. Hansen). — South-west of Iceland, at Lat. 63°46′ N., Long. 22°56′ W., 80 fath., an enormous number was secured by the "Thor". Furthermore it has been gathered at Iceland by the "Thor", Mag. R. Hørring, Mag. W. Lundbeck, Dr. A. C. Johansen and others in many of the Fjords; thus on the western side of Iceland in Kefla Vik, 15—16 fath., Faxe Bugt, 9½ and 25 fath., Dyre Fjord, 10—12¼ fath., and Ønundar Fjord, 11—12 fath.; on the northern side off Husa Vik, 42 and 48—53 fath.; on the eastern side in Mid Fjord, 5 fath., Bakke Fjord, 20—28 fath., Faskruds Fjord, 50—20 fath., and Loons Vik, 40 fath.; on the southern side at Vestman-Islands, 68—70 fath. At the Færoes it has been taken at Thorshavn (Lieut. Jensen). — Finally the IInd Amdrup-Expedition gathered it at East Greenland in Hurry Inlet, Lat. 70°50′ N., 10 fath.

Distribution. *E. emarginata* has a wide distribution outside our area. It is common in parts of southern Kattegat, penetrates far in the northern half of Store Belt and the Sound, and is common in the eastern parts of Kattegat; the depths recorded are from 7 to about 30 fath.; furthermore it has been gathered several times in Skager Rak, 70 to ab. 220 fath. (Meinert and H. J. Hansen). It occurs "rather plentifully along the whole Norwegian coast, from the Christiania Fjord to Vadso, in depths varying from 30 to 150 fathoms" (G. O. Sars). At Spitzbergen it has been taken four times, both on the western, the eastern and the north-western side, going northwards to Lat. 79°58′ N.; the depths were from ab. 10 to 231 fath., and the temperature at the bottom from 2.8° down to 0.2°. (Ohlin). Stappers records it from places at the southern coast of Novaya Zemlya, 32 and 48 fath.; Stuxberg from Matotschkin Schar, 30—50 fath., three places in the Kara Sea, 32 and 90 fath., and from three places more easterly in the Sibirian Ocean, 16 to 26 fath., the most eastern of these localities being Lat. 75°40′ N., Long. 78°40′ E.

Furthermore it has been recorded by various authors from various places in the North Sea, excepting its south-western part, and the "Thor" gathered it at some places in its northern half; the depths vary from about 19 to 212 fath. It has been recorded from the Hebrides (Norman), Firth of Clyde (Th. Scott), and in the Irish Sea off Ireland at Lat. 53°48′ N., 30—32 fath. (Calman). Finally it has been recorded from several places at the Atlantic coast of North America, viz. Labrador, 7 fath. (Calman); Gulf of St. Lawrence, 30 fath. (S. I. Smith); at places off Nova Scotia, 52 to 70 fath. (Smith, Calman); off Cape Cod, 16 fath., and off Marthas Vineyard, about Lat. 41½° N., 36 fath. (Calman).

18. **Eudorella hispida** G. O. Sars.

(Pl. I, figs. 8 a—8 c).

1871. *Eudorella hispida* G. O. Sars, Öfv. Kgl. Sv. Vet.-Akad. Forhandl. B. XXVIII, No. 1, p. 80.
!1871. — — G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Följd, B. 9, No. 13, p. 49, Tafl. XVIII, Fig. 95—97.
1912. — — Calman, Proc. U. S. Nat. Mus. Vol. 41, p. 621.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 79.

Sars established this species on a single immature female, $5^1/_2$ mm long, taken in a depth of only 30—35 fath. From a few stations I have several specimens, among them two females with marsupium, and in some essential points they show so much similarity to Sars' representation of *E. hispida* that they are referred to this species, though they differ in a few particulars of probably slight importance and — excepting one specimen — have been taken in rather considerable depths.

The carapace and all segments of the body have a number of thin hairs, but not nearly as many as drawn by Sars in his fig. 95. The anterior part of the lower margin of the carapace is nearly straight (figs. 8 a and 8 b), with small saw-teeth, but the angle between this line and the front margin is distinctly larger than shown by Sars (his fig. 96). The antero-inferior tooth is straight, nearly horizontal, long or very long. The front margin between this large tooth and the next tooth is rather long, scarcely or slightly concave and without vestige of any tooth. The antennal notch is in females deeper and more triangular than figured by Sars, with a small denticle on the lower and two denticles on the upper margin; in the immature male this notch is scarcely developed, and the front margin between the upturned tooth at the upper end and the downwards curved tooth farther below is feebly concave without serration. The abdomen is long and robust as figured by Sars.

The antennulæ (fig. 8 a) are somewhat robust, with many setæ; terminal joint of the peduncle almost as long as the outer flagellum, in which first joint is proportionately very long, more than three times as long as the second. First pair of legs moderately slender; propodus considerably longer than carpus and slightly more than twice as long as the dactylus. Second pair of legs are robust; carpus is very distinctly longer than merus and about as long as the two distal joints combined. — The uropods (fig. 8 c) are robust and very characteristic, agreeing with Sars' fig. 97; the peduncle is as long as the endopod, with a good number of spines at the inner margin; first joint of the endopod is very long, in adult specimens between five and six times as long as second joint, and it has numerous, in the specimen drawn 15, spines along the inner margin; second joint has 3 small spines on the inner margin and terminates in a very robust spine slightly shorter than the joint, and besides its end has a moderately long, thick seta; the exopod, which reaches slightly or somewhat beyond the end of first joint of the endopod, has numerous strong setæ not only along the inner margin but about five on the dorsal surface, and some shorter setæ on the outer margin.

Length of the adult female 7.2 mm.

Remarks. The robust animal with hairs on the whole body, the long, horizontal tooth from the antero-lateral angle of the carapace, the characteristic uropods with numerous spines and setæ and the very short second joint of the endopod agrees so much with Sars' figures, that I do not entertain any doubt as to the determination. Besides, Sars had only an immature specimen, and the differences between this and my animals seem to be of no specific value whatever, but only accidental or perhaps local variation. Calman (l. c.) mentions difficulties in referring individual specimens to *E. hispida* or to *E. truncatula* Bate.

E. gracilis G. O. Sars, established on a single adult female from the cold deep-sea area at Spitzbergen, is so closely allied to *E. hirsuta*, that a direct comparison of specimens of both forms is very desirable. The only differences of real value discovered by me on his figures are found in the uropods; according to Sars' figure of *E. gracilis* the second joint of their endopod is proportionately considerably longer, while first joint has a considerably lower number of spines, and the exopod only a single seta on its upper side.

Occurrence. Taken by the "Ingolf" at three stations in the warm area.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 2 specimens.

— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; 6½ specimens.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 1 specimen.

Besides a single specimen has been secured by Prof. D. Bergendal at Jakobshavn, West Greenland (Lat. 69°13′ N.).

Distribution. Recorded from a number of places at the Atlantic coast of North America from Nova Scotia southwards to Marthas Vineyard (about Lat. 41¼° N.), in depths from 1 to 4, 5, and 16 to 70 fath. (Sars, Smith, Calman).

19. **Eudorella arctica** n. sp.

(Pl. I, figs. 9a—9d).

Female. An ovigerous female and an immature specimen are to hand, and agree with one another in nearly all features of any importance. The species is closely allied to *E. truncatula*, but an important difference in the uropods renders a reference to the latter form impossible.

The immature specimen has a number of outstanding hairs on the surface of cephalothorax and abdomen, while they have nearly disappeared in the adult. On the carapace the antennal notch is somewhat long but rather shallow; in the immature specimen (fig. 9 a) one small and one large tooth are found above and two small teeth below the notch, while in the adult that serration is still more rudimentary. The antero-lateral tooth is long, robust and horizontal in the small specimen, but feebly developed in the adult.

First pair of legs (fig. 9 b) as in *E. truncatula*, as the propodus is considerably longer than the carpus and nearly more than twice as long as the terminal joint. In second pair of legs (fig. 9 c) the merus is somewhat thickened and nearly as long as the carpus; the terminal joint is moderately broad. — In the uropods (fig. 9 d) the peduncle is a little longer than the endopod, with several — in the adult about 7 — spines at the inner margin; the exopod reaches to or, in the small specimen, even beyond the end of the endopod, and has about 3 long setæ on the upper side, 4 setæ on the outer margin and the usual setæ on the end and on the inner margin; first joint of the endopod nearly three times as long as second joint, with about 7 spines on the inner margin, while the second joint has 2 spines on the inner margin, a rather long, very thick spine and an extremely long seta on the end.

Length of the ovigerous female 5.1 mm.

Remarks. The striking difference in the length of the rami of the uropods between *E. truncatula* and *E. arctica* makes it necessary to establish the latter species.

Occurrence. Not taken by the "Ingolf", but by the IInd Amdrup-Expedition at a single place: East Greenland: Cape Dalton, ab. Lat. 69°30′ N., 9—11 fath., July 20, 1900; 2 specimens.

20. Eudorella parvula n. sp.

(Pl. I, fig. 10a; Pl. II, figs. 1a—1f.)

Female (and subadult Male). Closely allied to *E. truncatula*, but much smaller and showing a few minor differences. Carapace nearly as in *E. truncatula*; the antennal notch in the females (figs. 1a—1c) somewhat short but rather deep and without teeth on the margins; below the notch the margin has 2 teeth of which at least the lower tooth is somewhat large; the margin of the interruption below these is in the females scarcely ever concave or straight, but has an angular protuberance which varies much in size and most frequently is low. The lower margin of the carapace is anteriorly curved much upwards, so that the tooth limiting the interruption is directed a little upwards and in reality situated on the front margin, while the next tooth is placed between the anterior and the lower margin, and these two teeth are uncommonly large. The front margin of the subadult male differs as usual materially from that in the female and is shown in fig. 1f, but a description is scarcely needed.

In the antennulæ (fig. 1a) the outer flagellum is not inconsiderably longer than the terminal joint of the peduncle. First pair of legs (fig. 1d) afford a character between this species and *E. truncatula*, as the propodus is at most one-fourth as long again as, and frequently only a little or slightly longer than, the carpus, and distinctly less than twice as long as the dactylus, while in *E. truncatula* it is more elongated, being one-third as long again as the carpus and at least twice as long as the dactylus. Second pair of legs (fig. 1e) nearly as in *E. truncatula*, though less robust; merus and carpus similar in length. — Uropods (fig. 10a) in the female with a lower number of spines than in *E. truncatula*; the peduncle a little shorter than the endopod, with about 4 spines along the inner margin; first joint of the endopod not quite three times as long as the second, with 5 or 6 spines on the margin, while second joint has only a single spine or two spines on the inner margin, a long and very thick terminal spine and an exceedingly long terminal seta; the exopod has a couple of setæ on the upper surface. In the subadult male the first joint of the endopod has 8 spines.

Length of the adult females 3.4—3.7 mm.

Remarks. Whether this species can be maintained as valid or may better be considered only as a variety of *E. truncatula* must be decided by a future investigator possessing a very large material from numerous localities. I am apt to consider it as a valid species, as I have a large material exclusively from rather deep stations in the Davis Strait, while not a single specimen of the much larger form *E. truncatula* has been found in any part of the "Ingolf" area. And the animals of *E. parvula* are very uniform as to size and features.

According to Sars *E. truncatula* goes to the Lofoten Islands, and he did not find it at Finmark. As Norman records it from East Finmark, his specimens ought to be carefully re-examined; besides I doubt whether the specimens mentioned by him as taken in 1443 fathoms at Lat. 55°11′ N., Long. 11°31′ W., or that recorded by Sars from Ellesmere Land belong to this species. Calman records a single specimen of *E. truncatula* from 120 fath. at Ireland, and I have noted it from 70 and 125 fath. in Skager Rak, but otherwise *E. truncatula* is only known from lesser depths or from shallow water.

Occurrence. *E. parvula* has been taken by the "Ingolf" at three rather deep stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 21 specimens.

— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; 9 specimens.

— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; numerous specimens.

Besides a single specimen was secured many years ago by Admiral Wandel near the "Ingolf" stations named, viz. at Lat. 65°36′ N., Long. 56°34′ W., 349 fath., temp. 3.2°.

21. **Eudorella intermedia** n. sp.

(Pl. II, figs. 2 a—2 d.)

Immature Female. Body with very few hairs, excepting as usual a number above the antennulæ on the carapace. Front part of the carapace completely similar to that in *E. truncatula* as to antennal notch, teeth below this notch, etc., excepting in one very important feature, viz. that the front margin from the notch upwards scarcely to the upper margin of the base of the antennulæ has a number of somewhat small saw-teeth (fig. 2 a). Antennulæ as to shape as in *E. truncatula*, but with more setæ; thus the last joint of the peduncle has 6 or 7 thick setæ on the upper margin and 6 setæ on the outer side. First pair of legs (fig. 2 b) robust; propodus rather short, slightly or scarcely longer than the carpus, and distinctly less than twice as long as the dactylus. Second pair of legs (fig. 2 c) nearly as in *E. truncatula*; merus slightly longer than the carpus and nearly as long as the two distal joints combined, which are moderately broad. — Uropods (fig. 2 d) somewhat robust; the peduncle as long as the endopod, with about 5 small spines on the inner margin; first joint of the endopod nearly more than three times as long as the second, with about 7 spines on the inner margin, while second joint has 3 spines on the inner margin, besides the long and thick spine and a very long seta on the end; exopod somewhat shorter than the endopod, with the setæ on the inner margin and the end strongly developed, and about 3 setæ on the upper surface.

Length of the largest immature specimen 5.3 mm.

Remarks. This species is as to the front margin of the carapace intermediate between *E. truncatula* Bate and *E. hirsuta* G. O. Sars; the saw-teeth above the notch occupy less than two-thirds of the anterior margin, and besides they are far from easy to observe, when the antennulæ are not removed. First pair of legs differ materially from those in *E. truncatula*, while second pair and the uropods are nearly as in that species; second pair differ from those in *E. hirsuta* by the short propodus.

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

Davis Strait: Stat. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fath., temp. 2.4°; 2½ specimens.

22. **Eudorella æquiremis** n. sp.

(Pl. II, figs. 3 a—3 d.)

Female (adult and subadult). Body with a moderate number of fine hairs. Carapace (fig. 3 a) anteriorly almost as in *E. intermedia*; the antennal notch normal, and just below it, between it and the somewhat short unarmed part one tooth or less frequently two teeth; the margin above the notch is serrated inconspicuously more than half of its length, with a few of the upper teeth somewhat large, but the majority rather small and not always easily seen; the lower margin of the carapace is anteriorly curved a good deal upwards.

The antennulæ normal (fig. 3 a). First pair of legs (fig. 3 b) with the propodus a little longer than, or only about as long as, the carpus and less than twice as long as the terminal joint. Second pair of legs (fig. 3 c) differ from those in *E. intermedia* in having the carpus conspicuously longer and much thinner than the merus, and carpus is as long as, or slightly shorter than, the two distal joints combined; terminal joint rather narrow. — Uropods (fig. 3 d) as long as the two distal segments combined; peduncle about as long as the rami, with 4 spines on the inner margin; exopod with 2 or 3 setæ on the upper side and none on the outer margin; the endopod, which does not overreach the exopod, has its first joint two and a half times as long as the second, with 5 spines on the inner margin; second joint has on the inner margin 3 spines, on the end the thick, rather long spine and a very long seta.

Length of an adult female 4.5 mm.

Remarks. *E. æquiremis* is instantly distinguished from all other northern species excepting *E. arctica* in having the endopod of the uropods not longer than the exopod; from *E. arctica* and the other forms excepting *E. intermedia* and *E. hirsuta* G. O. S. it is separated in having the major part of the front margin of the carapace above the notch serrated, but the serration extends less upwards than in *E. hirsuta*.

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

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1.5°; 7 specimens, among them 2 females with marsupium, 1 subadult female and 2 young males.

Eudorellopsis G. O. Sars.

Of this genus 2 species are observed in our area; both were previously known from West Greenland. It may be possible that the North American species *E. biplicata* Calman can in the future be discovered at West Greenland or Iceland.

23. **Eudorellopsis deformis** Kröyer.

1846. *Leucon deformis* Kröyer, Naturh. Tidsskr. Ny Række, B. II, p. 194 and 209, Tab. II, Fig. 4.
1849. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. V a, fig. 3, a—h.
1871. *Eudorella* — G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Foljd, B. 9, No. 13, p. 42, Tafl. XIX—XX, Fig. 101—118.
!1900. *Eudorellopsis deformis* G. O. Sars, Account, III, Pls. XXXI—XXXII.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 82.

Occurrence. Not taken by the "Ingolf", but gathered by other investigators at many places in a good deal of the area.

It has been recorded from two localities at West Greenland, viz. Godhavn, Lat. 69°14′ N., 8—10 fath., and Godthaab, Lat. 64°11′ N., 12 fath. (H. J. Hansen). At Iceland it has been taken many times by the "Thor", Dr. A. C. Johansen, Mag. B. Sæmundsen, Mag. R. Hørring and the ship "Beskytteren", in a good number of the Fjords on all sides of the island. Thus at the western coast it has been found at Reykjavik, 20—30 fath. (G. O. Sars), and in Faxe Bugt near Kolla Fjord, 9½ fath.; on the northern side in Nord Fjord at Skagestrands Bugt, 5—6 fath., in Skjalfándi, 10 fath., Thistils Fjord, 5 fath., Thorshöfn, 6 fath., and Myre Bugt, 33 fath.; on the east side of Iceland in Mid Fjord, 8½ fath., Bakke Fjord, 8—10 fath., Vopna Fjord, numerous specimens in stomachs of *Gadus æglefinus*, Hjerads Floi, 15—25 fath., several hundreds, and in Seydis Fjord, 6 fath.; south of Iceland it was gathered off Eyafjälla Jökul, 10, 17 and 23 fath. At the Færoes it has been taken in Bordo Vik, 7—10 fath., and in Trangisvaag Fjord, 12—16 fath. — It is not known from East Greenland or Jan Mayen.

Distribution. This species is common at Denmark in Lille Belt and Store Belt, not found in the Sound, but taken several times in various parts of Kattegat; the depths vary from 4 to 15 fath. (Meinert, H. J. Hansen). It is unknown from Skager Rak, and at Norway it has only been taken three times at the west coast between Lat. 58½° and 59½° N., in "comparatively shallow water" (G. O. Sars). In the North Sea it has been found at Heligoland (Ehrenbaum) and at various places more northwards, thus off Horns Rev, Northumberland, Firth of Forth, Aberdeen, Fair Isle (various authors); furthermore is it known from Clyde (Th. Scott) and at the north-eastern coast of Ireland, 3—5 fath. (Calman). Finally taken at some places near the east coast of North America from off Nova Scotia at Lat. 45°04′ N. southwards to Long Island, in depths from 8 to 57 fath. (Sars, Smith, Calman).

24. **Eudorellopsis integra** Smith.

1879. *Eudorella integra* S. I. Smith, Trans. Connect. Acad. Vol. V, p. 116.

!1887. *Eudorellopsis integra* H. J. Hansen, Vidensk. Medd. Naturh. Forening i Kjobenhavn for 1887, p. 201, Tab. VII, Fig. 3—3 c.

1913. — — Stebbing, Das Tierreich, 39. Lief. p. 83.

Occurrence. Taken by the "Ingolf" at four localities at West Greenland.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 3 specimens.

— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; 1 specimen.

Ameragdla (inner end of Ameralik Fjord), Lat. 64°12′ N.; many specimens.

Ameralik Fjord (in the estuary), Lat. 64°03′ N., 5—70 fath., 1 male.

Previously this species had been recorded from four places at the more northern part of West Greenland, viz.: Lille Karajak Fjord, Lat. 70°20′ N., (Vanhöffen); Kekertak, Lat. 59°58′ N., 35—40 fath.; Claushavn, Lat. 69°05′ N., 15—20 fath., and 280 fath.; Lat. 68°9′ N., Long. 56°32′ W., 50 fath. (H. J. Hansen). — It has not been found in any other part of the "Ingolf" area.

Distribution. S. I. Smith recorded this species from off Halifax, Nova Scotia, depths from 42 to 110 fath., and Gulf of St. Lawrence, 70 fath. Calman (1912) enumerates several localities near the east coast of North America from Battle Harbour, Labrador, southwards to the Gulf of Maine at Lat. 42°44′ N., depths from 42 to 110 fath.; besides he records it from two localities in the Bering Sea between about Lat. 57° and 57½° N., Long. 164°25′—164°27′ W., 29 and 36 fath.

Family Nannastacidæ.

This family is richly represented in the "Ingolf" area, as no less than 4 of the 7 genera hitherto established have been found.

Cumella G. O. Sars.

The forms belonging to this genus differ much from each other in general aspect, as in some species the legs and uropods are rather short and stout, but long and very slender in other forms. Furthermore the sexual differences as to armature of the carapace, shape of some of the joints in the thoracic legs and sometimes in the eyes are uncommonly pronounced. In the "Ingolf" area 2 new species have been discovered, and I follow Calman in referring *Campylaspis carinata* H. J. H. to *Cumella*, so that 3 species are mentioned here.

25. Cumella tarda n. sp.

(Pl. II, figs. 4 a—4 g.)

Adult Male. In general aspect similar to the male of *C. pygmæa* G. O. S.[1], but it is somewhat larger and several appendages are longer and more slender. As in that species the dorsal line of the carapace is nearly straight and completely without teeth, but the antero-lateral corner is broadly rounded, without angle or teeth, and the most anterior part of the carapace is less deep than in *C. pygmæa*, as its lower margin is more ascending. Pseudorostrum (figs. 4 a—4 b) is distinctly upturned, short, but yet longer than in *C. pygmæa*; its front margin is, seen from the side, somewhat oblique, with about four teeth on its lower half. The eye is not quite as large as in *C. pygmæa* and differs materially in having 4 pairs of ocelli, while *C. pygmæa* has 3 pairs and besides in the median a single very large ocellus not found in *C. tarda*; the dark pigment between the ocelli is more or less developed. The free thoracic segments and the abdomen nearly as in *C. pygmæa*.

The antennulæ (fig. 4 c) have the peduncle slender, considerably longer and much more slender than in *C. pygmæa*; its third joint is a little shorter than the second and distinctly longer than the upper flagellum. (The flagellum of the antennæ lost.) Second maxillipeds (fig. 4 d) mainly as in *C. pygmæa*, though more slender. Third maxillipeds (fig. 4 e) with third to sixth joint much thinner than in *C. pygmæa*; as in that species the merus has a tooth on the outer side. First pair of legs (fig. 4 f) differ much from those in *C. pygmæa* as fig-

[1] I refer to Sars' representation of this species in 1879, as he there gives a much higher number of figures of the male than in his "Account", 1900.

ured by Sars; second joint has no crista on the outer side; fourth joint, the merus, is proportionately slender, somewhat elongated and more than twice as long as the ischium; carpus and propodus together about as long as second joint, while in *C. pygmæa* they are considerably shorter than that joint. Second pair of legs with the 5 distal joints combined longer — in *C. pygmæa* shorter — than second joint; carpus distinctly longer than dactylus, and both very slender and rather elongated. — Uropods (fig. 4 g) elongated and slender; peduncle about as long as sixth, fifth and half of fourth abdominal segment combined, with about 11 spines on the inner margin; exopod half as long as the peduncle and somewhat, but not much, shorter than the endopod, which has a small apical spine and 12 spines on the inner margin, the most distal of these spines much longer and thicker than the others.

Length 3.3 mm.

Remarks. As seen in the description, the male *C. tarda* differs in a good number of features from the other northern species, *C. pygmæa*, of which I have seen males taken at Shetland by A. M. Norman. My specimens of *C. tarda* are all mutilated, so that a couple of less important particulars could not be described. The female can probably be recognized by the number of ocelli and in having antennulæ, third maxillipeds, first and second pairs of thoracic legs more slender than in *C. pygmæa*, finally by the relative length of the joints in these appendages.

Occurrence. Not taken by the "Ingolf", but by the IInd Amdrup-Expedition about at the following place.

South-West of the Færoes: Lat. 60°24' N., Long. 11°21' W., pelagic haul, Sept. 25, 1900, 8 p. m.; 10 specimens.

26. **Cumella egregia** n. sp.

(Pl. II, figs. 5 a—5 d.)

Adult Male. Carapace rather deep, about half as long again as deep; the dorsal edge considerably convex with about 13 spiniform processes not very regularly distributed and the majority somewhat long, the first longer than the others. Pseudorostrum (figs. 5 a—5 b) moderately short and considerably upturned; in the single adult specimen the left siphon is a moderately short cone with the end acute, while the right siphon protrudes as a long, membranous tube a good deal more than half as long as the carapace; the ocular lobe has no visual elements and is in the adult specimen as long as pseudorostrum, but it is easily perceived that its terminal part is lost: in a small specimen the ocular lobe is much longer than pseudorostrum, protruding as a process with the end acute (and in my figures of the adult this shape is rendered). The anterior margin of the carapace is somewhat concave, the antero-lateral corner rounded with an oblong, strong tooth, and from this tooth to the postero-lateral angle of the carapace runs a row of numerous outstanding teeth, and as this row is curved less downwards than the lower margin, it touches this margin towards both ends, while its median part is somewhat removed from it. The free thoracic segments are together only half as long as the carapace including pseudorostrum; second to fifth segment each anteriorly with a transverse row of small teeth above and down the sides, but on third and fourth segments the teeth near the dorsal line are rather long, and fourth segment has about four teeth on the dorsal edge. Abdomen slightly longer than the carapace rather slender, and all segments excepting the sixth adorned with a median dorsal row of long, curved teeth (figs. 5 a and 5 c), a median ventral row of short teeth and on each side far below the middle a longitudinal row of curved teeth shorter than those on the dorsal edge; sixth segment with a few teeth.

The antennulæ (fig. 5 a) slender, first joint of the peduncle much longer than second, which is somewhat longer than the third; outer flagellum about as long as second peduncular joint, while the inner flagellum is minute. The antennæ without setæ on the distal joints of the peduncle, the distal part of flagellum lost. Third maxillipeds with a strong tooth on the merus. The thoracic legs slender and somewhat long (fig. 5 a); in first pair the propodus is slightly shorter than the carpus and twice as long as the dactylus; in second pair the carpus is as long as the dactylus; in fourth pair the second joint has several fine teeth on its outer margin. — The uropods are very long and slender; the peduncle, which is as long as the two posterior segments together and about twice as long as the endopod, is adorned with three rows of teeth (fig. 5 d), viz. two with short teeth on the outer side and a row with longer teeth on the upper side rather near the inner margin; the endopod has on the inner margin 3 short, setiform spines on the proximal half and on the distal half 3 real spines, and between the two distal spines some three saw-teeth, while the end has a long, thick spine; the exopod is a little shorter than the endopod, with a single spine on the inner margin and an apical spine.

Length 4 mm.

Remarks. This species is easily recognized by the beautiful rows of teeth on the abdominal segments and the uropods. Besides the type I have the cephalothorax of a much smaller male which I refer to this species, though it differs in having seemingly only 3 or perhaps 4 dorsal processes on the carapace, while the teeth on the free thoracic segments are with few exceptions either lost or scarcely discernible; antennulæ, maxillipeds and thoracic legs similar to those in the type.

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

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 1½ specimens.

27. Cumella carinata H. J. H.

1887. *Campylaspis carinata* H. J. Hansen, Vidensk. Medd. Naturh. Forening i Kjøbenhavn for 1887, p. 207, Tab. VII, Fig. 4—4 a.

1905. *Cumellopsis* — Calman, Fisheries, Ireland, Sci. Invest. 1904, I. (1905), p. 28.

1912. *Cumella*(?) — Calman, Proc. U. S. Nat. Mus., Vol. 41, p. 426.

When I established the present species I had only a single specimen not belonging to our Museum, and therefore could not well dissect the mouth-parts, etc., of its left half. In 1905 Calman published notes on the mouth-parts and thoracic legs as results of an examination of a single specimen, and he was liable to refer it with some doubt to his new genus *Cumellopsis*. But in 1912 he returns to the subject, as he has obtained more material, and he is now of the opinion that the curious animal is more related to *Cumella*, in reality does not differ from that genus in any character justifying the establishment of a new genus. And according to his observations we may also safely omit the query still used by him.

Occurrence. Not taken by the "Ingolf", but by the IInd Amdrup-Expedition, Aug. 21, 1900.

East Greenland: Hurry Inlet, Lat. 70°50' N., 10 fath., 1 juvenile specimen with the last pair of legs not yet visible.

The type was taken off West Greenland at Disko in Nordfjord, Lat. 69°57' N., 25 fath., clay; it belonged to the Riksmuseum, Stockholm.

Distribution. Calman records three localities for this species, viz. the coast of Labrador; Lat. 46°48 1/2' N., Long. 52°34' W., 89 fath., and Lat. 45°29' N., Long. 55°24' W., 67 fath. In 1909 Sars recorded a specimen taken by the IInd "Fram"-Expedition at Ellesmere Land (ab. Lat. 79°30' N., Long. 106° W.), "outside the Forvisnings Valley, 2—20 fath.".

Cumellopsis Calman.

Only a single species, the type for the genus, has been found within our area.

28 Cumellopsis Helgæ Calm.

(Pl. II, figs. 6 a—6 d.)

!1905. *Cumellopsis Helgae* Calman, Fisheries, Ireland, Sci. Invest. I. (1905), p. 28, Pl. II, figs. 20—34.
1906. — — Calman, Mitth. Zool. Stat. Neapel, 17. B., p. 418—419.
1913. — *helgae* Stebbing, Das Tierreich, 39. Lief. p. 178.

A fine material of adult females is to hand. The carapace has on the whole more depressions and ridges than mentioned or figured by Calman, but as this adornment shows a little individual variation and the integument is rather thin and flexible, easily damaged, the value of smaller depressions and shorter keels is probably of rather little systematic importance. Some points may yet be mentioned. The long lateral depression is generally rather deep, but somewhat before the posterior end of the carapace it either nearly ceases or is interrupted by a short, transverse ridge, which cuts off its long anterior deep part from the much shorter posterior, more shallow portion. The ridge limiting that long depression below is sometimes rounded, sometimes sharp. Seen from above, the "slight median keel posteriorly" is distinct, but an area midway between the pseudorostrum and the first free segment has three longitudinal rounded ridges posteriorly close together, and the lateral pair, which are more distinct than the feeble median ridge, radiate forwards and somewhat outwards; the depressions between these rounded ridges are more or less pronounced, and the interval between each of the outer ridges, which ceases somewhat behind the base of pseudorostrum, and the longitudinal ridge limiting above the long above-mentioned lateral depression is somewhat excavated, forming an oblong, oblique depression. — In the immature males the dorsal ridges and depressions are less developed than in adult females, though still discernible. Adult males are unknown; in the 6 males to hand the terminal setæ on the exopods of third and fourth pairs of legs are extremely short, consequently seemingly undeveloped, and the antennæ could not be made out without dissection, which was not undertaken.

Figs. 6 a—6 c represent left third maxilliped, first leg and second leg of an adult female. By comparison with Calman's figures of the same appendages of an immature male it is seen that they are more slender as might be expected besides the carpus of third maxillipeds has distally on the outer side 1 teeth, and the end of second joint of first leg 2 teeth not found on Calman's figures.

Length of ovigerous females 5.5—5.7 mm.

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

South-West of Iceland: Stat. 81: Lat. 61°44' N., Long. 27°00' W., 485 fath., temp. 6.1°; 1 immature male.

Besides the "Thor" captured this form at 3 places.

South of Iceland: Lat. 63°15' N., Long. 22°23' W., 114—172 fath.; 1 immature male.

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 17 specimens, most of them adult females.

— — — Lat. 61°7' N., Long. 9°30' W., 443 fath.; 5 adult females.

Distribution. Hitherto known only from a single locality west of Ireland, viz. 77 miles W. N. W. of Achill Head, co. Mayo, 382 fathoms.

Procampylaspis Bonnier.

This interesting genus is easily separated from all other genera by the curious shape and armature of the terminal joint of second pair of maxillipeds. It may be remarked that first pair of legs are long, considerably longer than second pair, while in *Campylaspis* first pair are at most slightly longer and generally shorter than second pair. Only 4 species are recorded by Stebbing (1913), 2 among them from the southern hemisphere. In the "Ingolf" area 2 new species have been discovered, and it may be possible that a third species, ***P. armata*** Bonnier, also can be found[1].

29. Procampylaspis bituberculata n. sp.

(Pl. II, figs. 7 a—7 m.)

Subadult Female. Carapace, seen from above (fig. 7 b), almost half as long again as broad, somewhat oblong-ovate and rather narrowed forwards; considerably behind the middle a pair of proportionately large, broad and somewhat low, conical protuberances, each with a small spine on the top. Seen from the left side (fig. 7 a), the dorsal line shows the shape of left protuberance; pseudorostrum is turned sharply and considerably upwards, and its anterior margin is straight, yet directed from above a little backwards, without any notch, and the corner between this line and the lower margin is a very obtuse angle. The ocular lobe is narrow with the sides parallel, not half as long as pseudorostrum and without eyes. The free thoracic segments in the main as in *P. armata*; first segment dorsally at the middle produced as a small, bifid lamina with its two teeth curved distinctly forwards, second segment with similar, but nearly vertical teeth; fourth and fifth segments each with a pair of teeth somewhat from the median line. First abdominal segment with a pair of dorsal granules; otherwise granulation on the abdominal segments is indistinct or wanting.

[1] Of *P. armata* Bonn., first gathered in the Bay of Biscay, later in the Mediterranean and west of Ireland, 2 females and 1 male have been taken by the "Thor" in 1905 at Lat. 61°14' N., Long. 1°19' E., 85 fath., thus north-east of Shetland.

Second pair of maxillipeds (figs. 7 c—7 d) somewhat similar to that in *P. armata*, but the interesting terminal joint shows some differences. As in that species this joint has two proximal teeth and three more slender, subspiniform processes, but the two teeth are considerably broader, oblong-triangular, and the proximal tooth is shorter than in *P. armata*, while the distal tooth has a secondary small tooth on its distal margin; the first of the processes is longer than the proximal tooth and marked off by a suture; the second process is short, considerably curved, and a seta originates at its base; the terminal process is rather curved and only somewhat longer than the first. Third pair of maxillipeds (fig. 7 e) in the main as in *P. armata*, differ especially in having no teeth on the inner or outer margin of second to fifth joint excepting a tooth on the outer margin of the carpus; the merus has on the outer margin somewhat from the end a kind of tubular process (*t*) which might be taken as the basal part of a broken seta, but the aspect of its wall is different, and on the same spot I have found a similar tube in the male of the next species. First pair of legs (Fig. 7 f) nearly as in *P. armata*; the carpus is almost as long as the merus. Second pair of legs (figs. 7 g and 7 h) with merus, carpus and propodus somewhat robust; carpus not half as long again as merus, and at the end of its inner margin with a conical process (fig. 7 h) directed vertically inwards; dactylus not quite twice as long as the carpus. — Uropods (fig. 7 i) of moderate length; the peduncle about as long as the two posterior abdominal segments combined, somewhat less than twice as long as the endopod, which has 3 spines on its inner margin (the terminal spines on both rami lost).

Length of the specimen with the marsupium half developed 5.5 mm.

Adult Male. Carapace from above (fig. 7 l) very oblong-ovate, about three-fourths as long again as broad; considerably behind the middle a pair of small spines somewhat removed from one another, but the protuberances bearing in the female these spines have almost disappeared in the male. Seen from the side (fig. 7 k), the carapace is a good deal lower than in the female; pseudorostrum is turned considerably upwards, but its front margin is angular at the middle, as its upper half is subvertical, its lower half directed not only downwards but besides a little forwards. The ocular lobe is linear, much longer than in the female, though shorter than in the male *P. armata*. On the right side of the carapace the specimen to hand has three outstanding teeth on the posterior part of the lower margin. First and second free segment each with the dorsal median bifid lamella as in the female; the three posterior segments each with some dorsal small teeth and granules, and besides the lateral margins of all segments are irregularly adorned with a few teeth or sometimes only a single tooth. The granulation on the dorsal side of the abdominal segments very fine. — The uropods (fig. 7 m) longer than in the female; the peduncle which is only a little longer than the two posterior abdominal segments together and considerably less than twice as long as the endopod, has on the inner edge a good number of thin setæ, short and rather close together on the proximal half, and then gradually more distant and increasing strongly in length; the endopod has 8 spines on the inner margin and a long apical spine.

Length 5.7 mm.

Remarks. This species is allied and rather similar to *P. armata*, but is instantly distinguished in having a pair of spines somewhat from one another on the upper side of the carapace rather behind its middle, and in the female each of these spines is placed on the top of a large, broad, conical protuberance, which is rudimentary in the male. Third maxillipeds have no teeth on the inner margin of second to fifth joint while several teeth are found in *P. armata*; the conical process on the inner margin of the carpus of second legs is found in both sexes, but does not exist in *P. armata* or *P. macronyx*.

Occurrence. Not taken by the "Ingolf" but by the "Thor" in May 1904 at a single place South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.: 1 male and 1 female.

30. **Procampylaspis macronyx** n. sp.

(Pl. II, figs. 8 a—8 g.)

Adult Male. Carapace from above nearly as on *P. bituberculata*, excepting that no vestige of any dorsal spine or protuberances is found. Seen from the side, the carapace is not so low as in the preceding species, as the dorsal line is somewhat convex. Pseudorostrum is, seen from the side (fig. 8 a), peculiarly shaped, as its upper margin is considerably convex, the anterior margin concave and somewhat oblique, because the upper part of pseudorostrum is produced considerably forwards. Seen from above no ocular lobe could be observed between the lamellæ of pseudorostrum, and this lobe seems to be wanting. The two anterior free segments each with two submedian teeth, but these are smaller and scarcely originating from a lamella as in *P. bituberculata*, the segments otherwise nearly as in that species, but the number of teeth and granules is somewhat higher. The abdominal segments with some or a few teeth on the sides and very finely granulated above, first segment or besides the second with very few dorsal teeth.

Second pair of maxillipeds (figs. 8 b and 8 c) with the terminal joint most peculiarly developed. This joint has the same number of teeth and processes as in *P. armata* and *P. bituberculata*, but they differ exceedingly as to shape and size; the proximal tooth is triangular, of moderate size and much smaller than in the forms named; second tooth is rudimentary; the proximal process is more slender than in the two other species (in the mutilated "Ingolf" specimen this process is longer than in the type); second process is thin and close to the terminal process, which is somewhat curved and exceedingly elongated, nearly three times as long as the distance from its base to the origin of the joint. Third pair of maxillipeds (fig. 8 d) nearly as in *P. bituberculata*; there is no tooth on the outer side of the carpus, but the tubular process (*t*) on the merus is present. First pair of legs (fig. 8 e) in the main as in the preceding form, but the carpus is distinctly shorter than the merus. Second pair of legs (fig. 8 f) with the merus thick and not half as long as the somewhat slender carpus, which is only a little shorter than the dactylus and without any process at the end of the inner margin. — Uropods (fig. 8 g) considerably longer than in the male *P. bituberculata*; the peduncle is very long, almost as long as the three posterior abdominal segments together and more than two and a half times as long as the endopod, on the inner margin with about 15 pubescent setæ increasing much in length towards the end; the endopod which is a good deal longer than the exopod, has 5 or 6 spines on the inner margin and a very long apical spine.

Length of the type 6 mm., of the "Ingolf" specimen 7.5 mm.

Remarks. The male *P. macronyx* is easily separated from all other species hitherto known by the extremely elongated terminal process on the dactylus of second maxillipeds, and as the armature of the dactylus in other forms does not show sexual difference, the elongated process is in all probability also found in the female, which may be recognized by this feature. The male of *P. macronyx* differs besides from the same sex of the 3 other European species by the convex upper margin of pseudorostrum, no dorsal spines on the carapace and the very long peduncles of the uropods.

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

West of Iceland: Stat. 10: Lat. 64°24′ N., Long. 28°50′ W., 788 fath., temp. 3.5°; 1 mutilated male.

Besides it has been gathered by the "Thor" in 1904 at the following locality.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 1 male (type).

Campylaspis G. O. Sars.

Of this large genus about 24 species have been described in the literature, and representatives are known from nearly every sea. In the "Ingolf" area 10 species have been captured, but 5 among them are new, which indirectly indicates that even the European fauna of this genus is still somewhat imperfectly known[1].

Among the cephalothoric appendages especially second and third pairs of maxillipeds and first and second pairs of legs are generally recognized as affording specific characters. According to my experience third maxillipeds differ more from species to species than any of the three other pairs, and ought therefore always to be carefully figured; especially merus, carpus and propodus show excellent characters. It may be mentioned here that the merus shows a gradual development from a normal shape, f. inst. in *C. intermedia* (Pl. III, figs. 6 e—6 f) to that found in *C. verrucosa* (fig. 8 a), from this again to the allied deep-sea form *C. globosa* (figs. 9 c—9 d) from the Davis Strait, where the shape of the merus is rather curious, while in the closely allied antarctic species *C. frigida* H. J. H. (in Res. Voy. Belgica, 1908) the merus has been developed in the most extraordinary way in the same direction, so that its shape in *C. globosa* is intermediate between those in *C. verrucosa* and in *C. frigida*; all these 3 (or 4) species are allied and somewhat similar in aspect, and we have here an interesting connection between a boreal form, a deep-sea form from a sea with its coasts subarctic or arctic and a real antarctic species — but no bipolarity of a species.

Finally it may be mentioned that the colour of the species in some forms does not agree well with Sars' statements; variation or difference is mentioned later on at *C. rubicunda*, *C. undata* and *C. horrida*.

31. Campylaspis rubicunda Liljeb.

(Pl. III, fig. 1 a.)

1855. *Cuma rubicunda* Lilljeborg, Öfv. K. Sv. Vet.-Akad. Förh. Bd. 12, p. 121.

1873. *Campylaspis* — G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Följd, Bd. 11, no. 6, p. 10, Tav. IV, Fig. 14—16.

[1] *Campylaspis sulcata* G. O. S. and *C. costata* G. O. S. have not been found in the "Ingolf" area, but as both have been secured by the "Thor" north-east of Shetland at Lat. 61°14′ N., Long. 1°19′ E., 85 fath., and the last-named form besides north-west of the Hebrides at Lat. 58°20′ N., Long. 9°00′ W., 186 fath., it may be possible that they can be found west or south-west of the Færoes.

1887. *Campylaspis rubicunda* H. J. Hansen, Vid. Meddel. Naturh. Foren. i Kjøbenhavn for 1887, p. 207 (and 209).

!1900. — — G. O. Sars, Account, III, p. 84, Pls. LVI—LVII.

1913. — — Stebbing, Das Tierreich, 39. Lief. p. 190.

In 1887 (l. c.) I stated that the eye or the ocelli in this species had not been mentioned in the literature, and that I found two ocelli. In his Account Sars says "Eye distinct, semicircular and somewhat prominent", which is misleading. It is not the eye but the ocular lobe which is "semicircular and somewhat prominent"; on each side of this lobe I have constantly found an ocellus, but it was impossible to find any dorsal ocellus between the lateral pair, while on the end of the lobe one finds with difficulty two oblong, semivertical ocelli lying close together in the median line. Therefore Sars' figures O and O x on Pl. LXI present a curious difficulty, as his fig. O, the lobe seen from the left side, has two ocelli respectively on the side and at the end, consequently only two pairs, but his fig. O x, exhibiting the lobe from above, has an apical pair, a lateral pair and a single, large, dorsal ocellus at the base. In my specimens from various localities such a median dorsal ocellus does not exist.

Sars points out that the dactylus of second pair of maxillipeds has "four strong spines increasing in length from before backwards". This is a very fine character which I can verify, as I found the four spines increasing backwards in length both in a specimen from Norway and in one of the anomalously coloured females from Lat. 63°46' N. (fig. 1 a). So high a number of spines has not been found by Sars in any other species from Norway, nor by me in any species from the "Ingolf" area excepting *C. serratipes* n. sp., but in this species the second spine is much shorter than the third or the proximal spine.

The "Ingolf" specimen and the male from Lat. 63°15' N. have the red colour of the body well preserved and no dark dots. But the 6 speximens of both sexes from Lat. 63°46' N. are at least now only light reddish, and they have a large number of dark-brown, mostly very oblong dots spread partly irregularly on the body; these dots are sometimes so numerous on certain parts of the carapace that they are nearly confluent. It may be added that I found the joints in third maxillipeds and in first and second legs of one of these dotted females agreeing well as to shape and marginal teeth with Sars' figures.

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

North of Iceland: Stat. 128: Lat. 66°50' N., Long. 20°02' W., 194 fath., temp. 0.6°; 1 specimen.

C. rubicunda has been recorded from three places at northern West-Greenland, viz. Olrik Bay, Lat. ca. 77° N., 15—20 fath. (Ortmann), Kekertak, Lat. 69°58' N., 60—70 fath. (H. J. Hansen), and off Holstensborg, Lat. 66°59' N., Long. 55°27' W., 57 fath. (Norman). The "Thor" has secured it at the following two localities.

South-West of Iceland: Lat. 63°46' N., Long. 22°56' W., 80 fath.; 3 males, 3 females.

South of Iceland: Lat. 63°15' N., Long. 22°23' W., 114—172 fath.; 1 male.

Distribution. Recorded from the northern part of the Sound and the entrance to Odense Fjord (Meinert), a few places in Kattegat, 13 to 30 fath., and three places in Skager Rak, 85, 100 and 350 fath. (H. J. Hansen). At Norway it has been taken at several places from Christiania Fjord to Vadsø, generally in 30 to 100 fath. (Sars, etc.). Sars records a single very large specimen gathered by the Swedish Spitzbergen-

Exped. (1868) at Lat. 75°45′ N., 1050 fath.[1]; a good number of specimens was taken south of Novaya Zemlya at Lat. 70°20′ N., Long. 56°34′ and 56°35′ E., 48 fath. (Stappers). The "Thor" gathered it at a station north-east of Shetland: Lat. 61°14′ N., Long. 1°19′ E., 85 fath.; it has been recorded from the North Sea west of Jutland, 82 Fv. (H. J. Hansen), from two localities on the east coast of North England, 39 and 25 fath. (Norman and Brady), and from Scotland in Firth of Forth, Firth of Clyde, Moray Firth and Loch Fyne (Th. Scott). Finally it is known from places at the Atlantic coast of the Un. States, viz. in the Gulf of Maine, 35 fath. (Calman); in Casco Bay in the stomach of *Pseudopleuronectes americanus*, and off Cape Ann, Mass., 35 fath. (S. I. Smith); further south from Marthas Vineyard. 36 fath. (Calman).

32. **Campylaspis alba** n. sp.

(Pl. III, figs. 2 a—2 l).

Adult Female. Carapace strongly vaulted, proportionately short and deep; seen from above (fig. 2 a) and with pseudorostrum included scarcely half as long again as broad; seen from the side (fig. 2 c) only somewhat less than half as long again as deep. Pseudorostrum forms an obtuse angle with the dorsal line and is not even quite horizontal; seen from above (fig. 2 a) it is acutely triangular, seen from the side (fig. 2 c) the lower margin is strongly ascending, and only a vestige of an antennal notch is discoverable. The ocular lobe (fig. 2 b) is a small triangle occupying scarcely the basal fourth between the pseudorostral lamellæ, and it has no visual elements. The whole surface of the carapace is smooth, shining and looks as polished. The dorsal part of the three anterior free segments nearly or totally overlapped by the carapace; the two anterior segments with somewhat protruding dorsal lamellæ. Abdomen slender and very conspicuously shorter than the carapace.

Second pair of maxillipeds (fig. 2 d) robust; carpus (fig. 2 e) with a triangular tooth on the inner part of the terminal margin; dactylus with three long and strong spines subequal in length, and just before them a very robust seta considerably longer than the spines; the propodus has a somewhat small, oblong tooth at the distal inner angle, and the spine from the end is much longer than the spines on the dactylus and distinctly bent somewhat from the end. Third maxillipeds (fig. 2 f) broad, and in this respect nearly as in *C. rubicunda* or *C. glabra* G. O. S.; ischium produced on the inner side with a strong tooth on the end; merus broad, nearly as broad as second joint, about two-thirds as long again as broad, with the lateral margins subparallel and the inner margin without teeth, but a large, oblong tooth is found on the distal end at the outer margin; carpus scarcely two-fifths as long as merus and a little longer than broad, with 5 strong teeth on the inner margin and a single tooth on the outer; propodus with 3 teeth on the inner margin. First pair of legs (fig. 2 g) with the distal half rather slender; ischium with a tooth on the end, merus with a small tooth at the end of the outer margin, and otherwise all joints are unarmed. Second pair of legs (fig. 2 h) with the carpus slender and very long, slightly longer than the dactylus, which is thin and regularly tapering to the end. —

[1] It is extremely surprising that this species can live in that great depth. The specimen, a large but immature male, is according to Sars' representation uncommonly robust, especially the uropods (his fig. 16) are extremely thick. I think the determination is correct, but may suppose that the young male had been captured while swimming or adhering to some floating thing; unfortunately the exact locality is not stated, so that it is impossible to judge of its distance from lesser depths.

Uropods (fig. 2 i) slender and very long; the peduncle is fully as long as the three posterior abdominal segments combined, almost two and a half times as long as the endopod, with about 4 thin spines on the distal part of the inner margin; the endopod with 10 spines on the inner margin, a very long terminal spine, and all spines pectinate on both margins; the exopod is very little shorter than the endopod.

Length of females with marsupium 4.3—4.7 mm.

Male. The carapace differs in the usual way from that of the female; its anterior part seen from above is shown in fig. 2 k; the antennal notch is distinct, but its margin only very moderately concave; the shining, polished surface is characteristic. Uropods (fig. 2 l) still longer than in the female; the peduncle varies from being a little more to a little less as long as half of the third abdominal segment and the three posterior segments combined, not fully two and a half times as long as the endopod, with about 12 setiform spines along the inner margin; the endopod nearly as in the female, with about 12 thin spines on the inner margin, not counting the very long terminal spine; the exopod somewhat shorter than the endopod.

Length 5.1 mm.

Remarks. Many years ago I had determined this species as *C. nitens* Bonnier, established on an immature male scarcely 5 mm. long, but a closer examination revealed such differences in three of the appendages that my form must be considered a different species. Bonnier says that the inner margin of third to sixth joint of third maxillipeds is "régulièrement denticulé", and this statement agrees with his fig. 4 m (Pl. 28), but in my animals the large fourth joint has no vestige of such serration, third joint only the terminal tooth, and furthermore instead of the big tooth on the distal outer angle of the merus his figure seems to exhibit three small teeth on the outer margin. Though in other species of *Campylaspis* I have found some individual variation as to serration on the limbs, the differences in this respect between Bonnier's description and my animals are far too great to be considered as due to variation. His figure of second pair of legs has the carpus considerably shorter and thicker than in my animals, and he describes and figures the dactylus as "élargi", while in my specimens it is slender. Finally his description and figure of the uropods differ very much from my animals; according to Bonnier the inner margin of the peduncle is finely serrated, but such serration is not found either in the male or the female; furthermore he figures 5 or 6 spines on the inner margin of the endopod, while my specimens have a much higher number. Besides some further differences between *C. nitens* Bonn. and *C. alba* can be found by a comparison of the figures. While *C. nitens* Bonn. must be another species than my animals, I am convinced that the immature females taken west of Ireland and referred by Calman with a query to Bonnier's form in reality belong to *C. alba*, as his notes, pointing out differences between his specimens and *C. nitens*, show agreement with my form. — *C. pulchella* G. O. Sars is also similar in general aspect to *C. alba*, but differs sharply in the spinulation of the uropods, while second and third pairs of maxillipeds in *C. pulchella* are unknown.

Occurrence. Not taken by the "Ingolf" but by the "Thor" at two localities.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 10 females, 1 male.

— — — Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 24 specimens, ♀ and ♂.

Distribution. According to the "Remarks" gathered west of Ireland, 312 fath. (Calman).

33. **Campylaspis laticarpa** n. sp.

(Pl III, figs. 3 a—3 l.)

Adult Female. In general aspect somewhat similar to *C. rubicunda*, but considerably larger. The carapace seen from above (fig. 3 a) and pseudorostrum included is a little more than half as long again as broad, and about ovate, but a good deal of the posterior margin is very feebly convex, and the anterior third of the lateral margin to the middle of the frontal lobe is a little more convex than in *C. rubicunda*, while the front angle of pseudorostrum is less acute. The ocular lobe (fig. 3 b) occupies more than half of the length of pseudorostrum; it is oblong, broader beyond the middle than at the base, anteriorly rather broadly rounded, and a pair of lateral ocelli are sometimes but not always perceptible. Seen from the side (fig. 3 c) the carapace with pseudorostrum is twice as long as deep; pseudorostrum is moderately short, nearly horizontal; the antennal notch is small but very distinct, triangular, and the angle below it a little protruding. About on the anterior half of the dorsal surface and somewhat downwards on the sides the carapace has a number of irregularly distributed, very small and low, rounded protuberances, which sometimes are rather distinct, sometimes very feebly developed; besides the middle part of the dorsal median line is sometimes, but not always, distinctly impressed. The carapace covers nearly totally the three anterior free segments, and the dorsal part of each of the two anterior segments protrudes a little, but has no distinct lamella. The abdomen is moderately robust and as long as the carapace.

Second pair of maxillipeds (fig. 3 d) moderately strong; carpus with a broad, acute protuberance on the inner side before the end; propodus (fig. 3 e) with the inner distal angle produced as a triangular, acute protuberance, and the distal half of the inner margin nearly straight with numerous short spines, while the spine on the outer terminal angle is not very long but extremely robust, with the usual bend beyond the middle and its distal part with some spines on the inner margin; dactylus with 3 spines, the first a little shorter than the third and considerably overreaching the second. Third pair of maxillipeds (fig. 3 f) are very characteristic; merus is large, long and broad, a little less than twice as long as broad, distally with the outer part much produced but its end obtuse; carpus is very large, two-thirds as long as, and not much narrower than, the merus; propodus proportionately small, oblong; all joints without marginal teeth. First pair of legs (fig. 3 g) normal; ischium with a tooth on the inner angle; merus thicker but not longer than the carpus, and both joints without marginal teeth. Second pair of legs (fig. 3 h) of very moderate length, as carpus and dactylus are somewhat short, and equally long. — Uropods (fig. 3 i) only moderately long; peduncle a little longer than the two posterior abdominal segments together and considerably more than twice as long as the endopod, with the inner margin finely serrated; endopod with 3 spines on the inner margin and 3 terminal spines, the median very long, the outer very short; exopod somewhat shorter than the endopod.

Length 7 mm.

Male. Carapace (fig. 3 k) differs in the normal way from that of the female, and has similar rudimentary tubercles on the surface; the antennal notch is moderately and evenly concave, deeper and especially broader than in the female, but an angle below it is not developed. The median dorsal lamella on first and second free segment is distinct but short. — Uropods (fig. 3 l) more slender and distally longer than in the female;

peduncle about as long as the two posterior abdominal segments and half of fourth segment combined, slightly more than twice as long as the endopod, with most of the outer margin extremely finely serrated, while the inner margin has about 12 robust setæ increasing in length from the first to the last; endopod with 10 spines on the inner and 2 on the terminal margin; exopod a good deal shorter than the endopod.

Length 7.5 mm.

Remarks. *C. laticarpa* is separated especially by having the carpus of third maxillipeds longer and very much broader than in any other northern species of *Campylaspis*; the size and shape of merus and carpus can easily be seen without dissection, and the absence of marginal teeth in this pair of appendages is, besides, a good specific character. On the colour little can be said; the animals are now whitish, often with numerous extremely small, dark-brown dots; in some specimens larger and partly confluent brownish red dots are found on the peduncles of the uropods.

Occurrence. Not taken by the "Ingolf" but by the "Thor" in May 1904 at two places

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 38 specimens, and ;
— — — Lat. 61°07' N., Long. 9°30' W., 443 fath.; 2 specimens.

34. Campylaspis undata G. O. Sars.

(Pl. III, fig. 4 a).

1865. *Campylaspis undata* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1864, p. 205.
!1900. — — G. O. Sars, Account, III, p. 88, Pl. LXI.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 195.

A comparison between my female specimens and Sars' representation gave the following results. The carapace agrees with his figure excepting that the pseudorostrum seen from the side looks a little more produced and has its front margin distinctly as a whole more oblique; between the upper longitudinal ridge and the lower one there is anteriorly nearly below the large sublateral protuberance a more or less conspicuous, very rounded, subvertical ridge not figured by Sars in the female *C. undata*, but in the male and besides in *C. horrida* and *C. verrucosa*; furthermore there is sometimes a feeble and short piece of longitudinal keel rather far behind between the two very long lateral keels. In second pair of maxillipeds the distal inner corner of the carpus is somewhat produced in a triangular tooth; the propodus has near the end of the inner margin a very conspicuous, oblong tooth; thus the two teeth mentioned are considerably more developed than in Sars' fig. mp^2 but there is complete agreement between his figure and the maxilliped examined by me in the spines on the dactylus and the terminal spine on the propodus. Third pair of maxillipeds (fig. 4 a) differ in some particulars from Sars' fig. mp^3; the ischium has 2 teeth (not a single tooth) on the inner end; merus differs considerably in shape, as in my specimens the inner margin is distinctly concave, the outer margin feebly angular near the middle and sooner convex than concave, while in Sars' figure both margins are curved in the way opposite, but I think that this figure is incorrect; as to marginal serration the differences between Sars' figure and the features observed by me are of no importance (in maxillipeds of three specimens I found also a little variation as to marginal teeth). First pair of legs differ only from Sars in having a tooth on the outer margin of the carpus, second pair of legs in having a few teeth on the proximal part of the outer margin of the carpus. On the inner margin of the endopod of the uropods Sars figures only 3 spines; I found the same number in a single specimen, but otherwise 4 or 5 spines. — As to the colour it ought to be noted, that both body and appendages are adorned with numerous or innumerable dark-brown or reddish-brown dots, generally separate or sometimes confluent, and on the carapace these dots are especially found on the ridges and protuberances, which therefore are very conspicuous in opposition to the more or less excavated areas, where the dots are proportionately moderately few in number.

In spite of the differences pointed out I believe that my specimens belong to *C. undata* G. O. S.

Occurrence. Not taken by the "Ingolf" but by the "Thor" at two places, together with the two preceding and some of the following species of this genus.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 7 specimens.

— — — Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 1 specimen.

Distribution. Hitherto only recorded with certainty from off the Lofoten Islands, 100—200 fath. (G. O. Sars). The "Thor" gathered a specimen between Shetland and the Færoes at Lat. 61°35′ N., Long. 4°39′ W., 212 fath. Lo Bianco's statement on its occurrence in the Mediterranean ought to be considered as doubtful.

35. **Campylaspis rostrata** Calm.

(Pl. III, figs. 5 a—5 c).

This species, which was established on a single immature female, has been well figured and described by Calman. The form is instantly separated from all other northern species by the long and most peculiarly shaped pseudorostrum. As Calman did not examine the two posterior pairs of maxillipeds in his specimen, they are figured and briefly mentioned here. Second pair of maxillipeds (figs. 5 a and 5 b) robust; carpus without any tooth on the inner side; dactylus with 3 spines, the first and the third strong and subequal in length, while the second is quite short; propodus produced considerably at the end of the inner side, but the tooth is short and blunt, while the spine on the distal end is robust, only a little overreaching the distal spine of dactylus, and with a sharp bend a little before the end. Third maxillipeds with the distal half somewhat slender (fig. 5 c); ischium extremely produced forwards on the inner side and terminating as a triangle without any tooth; merus only half as broad as the middle part of second joint, its inner margin nearly straight with a couple of teeth, and at the end of the outer margin a thick, nearly blunt tooth; carpus with some 3 teeth on the outer margin, and propodus with a single strong tooth on the proximal part of the inner margin.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single locality.

South-West of the Færoes: Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 1 subadult and 1 very young specimen.

Distribution. The type was gathered west of southern Ireland, 312 fath. Besides specimens have been taken by "Travailleur" and "Talisman" at Lat. 35°24′45″ N., Long. 10°19′7″ W., 640 fath., and Lat. 25°38′ N., Long. 18°29′ W., 561 fath. (Calman).

36. **Campylaspis intermedia** n. sp.

(Pl. III, figs. 6 a—6 i).

Female (with the marsupium scarcely half-developed). In general aspect nearly intermediate between *C. costata* G. O. S. and *C. verrucosa* G. O. S. Carapace seen from above (fig. 6 a) rather oblong, as the proportion between breadth and length is about as 3 to 5, a good deal of the lateral margins feebly divergent from in front backwards, but anteriorly these margins rather suddenly converge strongly to near the end of pseudorostrum, which is broadly rounded. The ocular lobe about as long as the pseudorostrum in front of the lobe. Seen from the side (fig. 6 b) the carapace is of moderate depth, scarcely half as deep as long including pseudorostrum, which is somewhat produced and a little upturned, the antero-inferior margin is rather oblique, the antennal notch well developed, and the angle below it a little protruding. The sides of the carapace show as in *C. costata* two longitudinal, long ridges separated by a deep depression, which considerably behind the front end is partly interrupted by a low, broad protuberance; besides between the posterior third of these ridges a third ridge, which has its anterior end united with the long lower ridge, but this species differs from *C. costata* in having several rounded, moderately low tubercles on the upper and about three tubercles on the intermediate ridge. Seen from above, the carapace (fig. 6 a) has in more than its posterior half a longitudinal, a little curved row of about five tubercles on each half not far from the median line, and just behind the outer end of the suture separating the pseudorostrum a large tubercle is very conspicuous; besides some small tubercles are observed on the anterior half. The tubercles, excepting the anterior sublateral pair, are on the whole low and rounded. The two anterior free segments are overlapped by the carapace; they have dorsally no really lamellar expansion. — Abdomen moderately robust, as usual conspicuously shorter than the carapace, the three anterior segments each with a pair of obtuse tubercles.

Second pair of maxillipeds (figs. 6 c—6 d) somewhat slender, carpus with a triangular tooth on the distal inner angle, dactylus with 3 spines, the first strong and rather long but shorter than the third, while the second is very small, propodus with the inner angle somewhat produced, acute, while its terminal spine scarcely overreaches the third spine of the dactylus. Third pair of maxillipeds (fig. 6 e) with the distal half slender, second joint serrated on the distal part of its inner margin, ischium with two teeth at the inner end, merus (fig. 6 f) conspicuously less than half as broad as long, its inner margin distinctly concave with several fine teeth, the outer margin a little convex with a large tooth towards the end and a couple of much more proximal, minute teeth, carpus with some teeth on the outer margin. First pair of legs (fig. 6 g) with the distal half slender, second joint serrated on the distal part of the inner margin; the following joints without teeth, and merus a little longer but slightly thicker than carpus. Second pair of legs (fig. 6 h) without marginal teeth, carpus of middle length and slightly shorter than dactylus. — Uropods (fig. 6 i) somewhat slender, the peduncle as long as the two posterior abdominal segments together, slightly more than twice as long as the endopod, with low saw-teeth on the inner margin, the endopod with 5 spines on the inner margin, a very long spine and a quite short one on the end; exopod about as long as, or slightly shorter than, the endopod.

Length 5.5 mm. (An immature male from Stat. 116 is 5.8 mm.)

Remarks. *C. intermedia* is distinguished from *C. sulcata* by the tubercles on the sides, from *C.*

horrida or *C. verrucosa* by the tubercles on the carapace being less numerous and especially much lower; from *C. verrucosa* it is also sharply separated by the shape of the merus in third maxillipeds.

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

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 11 specimens.

South of Jan Mayen: Stat. 116: Lat. 70°05′ N., Long. 8°26′ W., 371 fath., temp. ÷0.4°; 2 specimens.

37. **Campylaspis horrida** G. O. Sars.

(Pl. III, fig. 7 a).

1870. *Campylaspis horrida* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1869, p. 162.
1894. — — Norman, Ann. Mag. Nat. Hist. ser. 6, Vol. XIII, p. 278, Pl. XII, figs. 6—7.
!1900. — — G. O. Sars, Account, III, p. 89, Pl. LXII.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 196.

The species is characterized by the rather produced pseudorostrum and especially by the high, conical tubercles on the carapace. It agrees on the whole with Sars' figures, but some remarks must be made. The carapace of the female has always posteriorly between the submarginal and the subdorsal keels a short keel with two to five tubercles visible from the side, while the right figure of Sars shows only a single tubercle. — In the two posterior pairs of maxillipeds I found some differences from Sars' figures. Second maxillipeds agree excepting in two points, viz. that the carpus has an oblong tooth on the distal inner angle, and propodus a rather large, oblong one on the inner side near the end. Third maxillipeds differ in having the ischium shorter and without distinct teeth, but the latter point is certainly on insignificant variation; a more important difference is found in the shape of the merus (fig. 7 a) which is conspicuously more narrow than figured by Sars, with its inner margin somewhat concave. — The uropods show very considerable variation as to length, thickness and serration of the peduncles, breadth of the endopod and its number of spines. Sars says that their peduncle is "coarsely serrated on both edges" and the endopod "armed with only 4 spinules"; according to his figure 3 on the inner margin, 1 long terminal spine, while the small outer terminal spine is not counted; in his figure of the adult female the peduncle is scarcely as long as the two posterior abdominal segments combined, while his fig. "urs" shows the saw-teeth on the inner margin to be rather high and distinctly higher than those on the outer margin. In a few specimens with vestiges of marsupial lamellæ the peduncle is even a little shorter than the two posterior segments together, robust, with the serration on both margins as in Sars' figure, while the endopod is somewhat broad, as drawn by Sars, with 3 or 4 spines on the inner margin and the 2 terminal spines. In two females with the marsupium fully developed the peduncles are proportionately more slender and considerably longer, even in one female somewhat longer than the two posterior segments combined, and the serration on both margins is conspicuously more feeble, on the outer margin nearly indistinct, the endopod more narrow, with 3 spines on the inner margin. Some females with the marsupium rudimentary are intermediate between those described, though generally more similar to the adults, but the number of spines on the inner margin of the endopod varies from 3 to 5. The peculiarities described show that length and serration of the peduncles, slenderness and spinulation of the endopods ought to be applied with caution as specific characters in this genus.

In most of my females the ridges and tubercles of the carapace are adorned with small dark dots, and some similar dots are also frequently found on the abdomen, the uropods, etc.

Occurrence. **Not taken by the "Ingolf", but by the "Thor" at four localities.**

South of Iceland: Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; 2 females.

— » — Lat. 63°05′ N., Long. 20°07′ W., 290 fath.; 2 females.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 2 females.

— — — Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 5 females.

Distribution. At several places at the west coast of Norway from Hardanger Fjord to Lofoten, 100—300 fath. (G. O. Sars). The "Thor" captured it south-west of Norway at Lat. 58°32′ N., Long. 4°18′ E., 140 fath. Calman referred with some uncertainty a broken specimen from Lat. 39°59½′ N., Long. 70°30¾′ W., 428 fath., to this species; he refers also with some doubt a specimen from Sagami Bay, Japan, to *C. horrida*, but his remarks on its size and especially the more slender distal joints in some appendages make it rather certain that it must be a different species, which he also suggests as a possibility. Lo Bianco's statement on its occurrence in the Mediterranean may possibly be correct, but it is not very probable.

38. Campylaspis verrucosa G. O. Sars.

(Pl. III, fig. 8 a).

1866. *Campylaspis verrucosa* G. O. Sars, Nyt Mag. for Naturv. Vol. XV, p. 105.
1894. — — Norman, Ann. Mag. Nat. Hist. 6. ser., Vol. XIII, p. 278, Pl. XII, fig. 7.
!1900. — — G. O. Sars, Account, III, p. 90, Pl. LXIII.
1913. — — Stebbing, Das Tierreich, 39. Lief, p. 198.

Only a few remarks on some appendages shall be made for comparison with Sars' figures. I found in second pair of maxillipeds a well developed, triangular tooth on the distal inner angle of the carpus, a somewhat slender tooth on the distal inner angle of the propodus, only a slight difference in the length of first and third spine of the dactylus, both these spines longer than figured by Sars, and between them the second, very small, but distinct spine. In third maxillipeds I found more important difference in the size and shape of the merus; fig. 8 a shows this joint larger than figured by Sars in proportion to carpus, only a little narrower than the distal part of second joint, and somewhat expanded inwards, as its inner margin has the proximal two-thirds somewhat convex, and then it is suddenly angularly bent; some differences in the teeth on the merus and the two following joints may be observed by comparison between fig. 8 a and Sars' fig. *mp*³. In first pair of legs I found on the outer margin of the merus some small teeth and a long subterminal tooth, otherwise his figures of this leg and of second leg agree with my preparation. The expansion of the merus of third maxillipeds is a good character and besides of special interest (see "Remarks" at the next species).

Occurrence. Not taken by the "Ingolf" but by the "Thor" at four localities.

South of Iceland: Lat. 63°18′ N., Long. 21°30′ W., 95 fath.; 1 specimen.

— » — Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; 15 specimens.

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; many specimens.
— — — Lat. 61°07' N., Long. 9°30' W., 443 fath.; large number of specimens.

Distribution. Found "along the whole south and west coast of Norway, as far north as the Lofoten Islands", in 60 to 100 fath. (G. O. Sars); Sars and Norman, however, had in 1872 and 1894 recorded it as taken in two Fjords in 100—300 fath. Taken three times in Skager Rak in depths from 280 to 350 fath. (H. J. Hansen), six times west of Ireland, 120 to 454 fath. (Calman), and several times in the Mediterranean near Capri, 106—637 fath. (Calman). — *C. verrucosa* var. *antarctica* Calm. from Lat. 66°2' S., Long. 89°38' E., 385 m., will in all probability in the future be recognized as a separate, valid species, and Stebbing has already in Das "Tierreich" 39. Lief. p. 199 established it as *C. antarctica* Calm.

39. **Campylaspis globosa** n. sp.

(Pl. III, figs. 9 a—9 g; Pl. IV, figs. 1 a—1 b).

Adult Female. The carapace somewhat similar to that in *C. verrucosa*, but seen from above (fig. 1 a) proportionately broader with the major part of the lateral margins more convex, conspicuously less than half as long again as broad; seen from the side (fig. 1 b) twice as long as deep, with pseudorostrum somewhat produced and a little upturned; the antennal notch rather deep, the corner below it angular, and the margin above it somewhat convex and rather oblique. Both above and on the sides the carapace is adorned with tubercles, all rounded and differing much in size, the majority arranged into four pairs of longitudinal but somewhat curved or partly irregular rows; the lateral impression is anteriorly bent considerably upwards, and its middle part is deep. Dorsal erect lamellæ on the two anterior free segments could not be detected. Abdomen considerably shorter than the carapace; on the two anterior segments dorsal tubercles are feebly developed, on third segment scarcely perceptible.

Second pair of maxillipeds (fig. 9 a and 9 b) rather similar to those in *C. verrucosa*, but the tooth on the inner angle of both carpus and propodus is small; first and third spine on the dactylus long, while second spine is very short and thin; the spine on the end of propodus somewhat overreaches the spines on the dactylus. Third pair of maxillipeds (fig. 9 c) somewhat slender; second and third joints without teeth; merus extremely characteristic (fig. 9 d), as it is expanded considerably on the inner side in a low triangle, the proximal half of its inner margin is nearly straight and directed not only forwards but considerably inwards, while the distal half of the margin forms an angle with the proximal half, is directed considerably outwards and besides somewhat concave; the merus is about half as long again as broad, with a rather small tooth at the base of the distal, strong seta; carpus normally shaped, rather oblong, with about two teeth on the outer margin. First pair of legs (fig. 9 e) slender; second joint tapers considerably from the middle to the end; ischium with a tooth on the inner margin; merus very slender, considerably longer but slightly broader than carpus, and both these joints without teeth. Second pair of legs (fig. 9 f) with carpus elongated and very slender, somewhat shorter than the very long and thin dactylus. — Uropods (fig. 9 g) moderately strong; the peduncle scarcely as long as the two posterior abdominal segments together and distinctly less than twice as long as the endopod, with more than half of the inner margin somewhat coarsely serrated, and the major proximal part of the outer margin finely serrated; endopod with 3 spines on the serrated inner margin, one long and one short apical spine.

Length 5.6 mm.

Remarks. This species is intermediate between *C. verrucosa* G. O. S. and *C. frigida* H. J. H., though nearer to the latter form, which was collected by the "Belgica" at Lat. 70°48' S., Long. 91°54' W. The curious expansion of the merus is still more developed in *C. frigida*, in which that joint is as broad as long; as to the shape of merus *C. globosa* is intermediate between *C. verrucosa* and *C. frigida*, and the relationship between these three species from most different localities has been mentioned above on p. 36.

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

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 1 adult female.

40. **Campylaspis serratipes** n. sp.

(Pl. IV, figs. 2 a—2 h).

Subadult Female (and immature Male). Carapace seen from above (fig. 2 a) nearly regularly oblong-oval, excepting at the front end which is cut off transversely, and it is considerably less than twice as long as broad; seen from the side (fig. 2 b) the carapace is highly vaulted, very deep, with the pseudorostrum included considerably less than twice as long as deep, about as deep as broad. Pseudorostrum short and a little upturned, the antennal notch moderately or somewhat feebly developed, and the upper part of the oblique margin below the notch with some saw-teeth. The ocular lobe broader than long, nearly half as long as pseudorostrum. The dorsal side of the carapace with a pair of longitudinal rows of tubercles; the rows are posteriorly nearer the median line than anteriorly, and each row consists of 5 or 4 rather small, more or less conical or rounded tubercles; behind the pseudorostrum a broad but proportionately somewhat low tubercle is placed more laterally; finally the upper part of each side has one just discernible small tubercle and sometimes a vestige of a second or even a third tubercle. The dorsal part of the two anterior free segments frequently completely concealed by the carapace; when visible it is observed, that each segment has a high transverse keel, which is not really lamellar. Abdomen as usual conspicuously shorter than the carapace; the segments without dorsal tubercles.

Second pair of maxillipeds (figs. 2 c and 2 d) peculiarly armed; carpus with an extremely long, spiniform process on the distal inner angle and before it an acute tooth; propodus with an uncommonly long, spiniform process on the inner margin before the end, and the outer terminal spine is rather long; dactylus with 4 spines, the first long, about as long as the third and considerably longer than the second, while the fourth is only about half as long as and much thinner than the third. Third pair of maxillipeds (fig. 2 e) with second joint uncommonly short, much shorter than the five following joints combined; ischium with two teeth on the inner margin; merus normally shaped, somewhat less than twice as long as broad, with two strong teeth on the inner margin and some three teeth on the outer; carpus oblong and scarcely longer than the breadth of merus, with three strong teeth on the inner and four on the outer margin; propodus rather long, with three very strong teeth on the proximal part of the inner margin and a smaller tooth on the outer margin. First pair of legs (fig. 2 f) moderately slender; ischium with two teeth on the inner side; merus a little more than twice as long as broad, with a tooth at the end of each margin; carpus distinctly shorter and more narrow than merus, with four teeth on the inner and three on the outer margin. Second pair of legs (fig. 2 g) without teeth; carpus somewhat long and moderately slender; dactylus very long, even slightly longer than carpus and propodus together. — Uropods (fig. 2 h) vary as to length; the peduncle is from a little more to conspicuously less than the two posterior abdominal segments combined, and its length in proportion to the long endopod varies from being $^7/_4$ to scarcely $^6/_4$; the inner margin of the peduncle is coarsely serrated, and some or several of the teeth are elongated, nearly spiniform, a little curved and directed much backwards, while the outer margin is partly finely serrated or smooth; the endopod is long, with the inner margin serrated nearly as the peduncle and armed with 3 spines, the distal one at the end near the very long terminal spine, while the outer terminal spine is very small. The exopod is somewhat shorter than the endopod.

Length of females with the marsupium half developed 3—3.6 mm.

Remarks. *C. serratipes* is in general aspect somewhat similar to *C. affinis*, but it is considerably smaller and its appendages differ in many particulars; especially the armature of the two distal joints of second maxillipeds and the serration on third to sixth joint of third maxillipeds and third to fifth joint of first legs differ much in the two species; further differences are found in the uropods, especially in the number of spines on the inner margin of the endopod. The name *serratipes* has been chosen, because the marginal serration in some pairs of appendages is more developed than in any other northern species. — Sometimes a proportionately somewhat low number of small dark dots may be seen on carapace and abdomen.

Occurrence. Taken by the "Ingolf" at two stations in the warm area.

West of Iceland: Stat. 90: Lat. 64°45′ N., Long. 29°06′ W., 568 fath., temp. 4.4°; 1 specimen.

South-West of Iceland: Stat. 78: Lat. 60°37′ N., Long. 27°52′ W., 799 fath., temp. 4.5°; 12 specimens.

Family Pseudocumatidæ.

This small family comprises only two marine genera with some few species, but it has arrived at much richer development in the Caspian Sea. Only one of the marine genera has been found in the "Ingolf" area, but as the other genus, *Pseudocuma* G. O. S., goes northwards to Lofoten, Fair Isle and Scotland, it may possibly occur at the Færoes.

Petalosarsia Stebbing.

Only a single species is known.

41. Petalosarsia declivis G. O. Sars.

1865. *Petalopus declivis* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1864, p. 197.
!1900. *Petalosarsia* — G. O. Sars, Account, III, p. 77, Pl. LIV.
1911. — — Stappers, Camp. Duc d'Orléans, Crust. Malac. p. 121, Pl. VI, figs. 11—12.

Sars says that the inner edge of the endopod of the uropods is "minutely serrate and densely hairy throughout", which agrees well with his fig. *urs*, but is not quite correct. The hairs constitute a dense clothing on the inner side of the endopod, and the saw-teeth are arranged in a straight line a little above the clothing, and directed not only inwards and backwards but besides a little upwards; when the abdomen is seen vertically from above the saw-teeth originate slightly inside the margin and are seemingly minute, but when the endopod is turned a little so that one sees it from above and a little from the outer side, the saw-teeth, only about 12 in number, are perceived to be rather strong, and the distal teeth even produced in a slender triangle. — Sars has no figure or description of the male uropod, but Stappers has filled up that small gap; the endopod has on the distal part of the inner margin 9 somewhat small, ciliated spines but no hairs, while the hairs are well developed on the major proximal part of the inner margin. Stappers' fig. 12 agrees completely with the uropods of a male taken by the "Thor", excepting that I find the hairs on the inner margin much longer than drawn by Stappers, longer than the diameter of the joint.

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

Davis Strait: Stat. 31: Lat. 66°35' N., Long. 55°54' W., 88 fath., temp. 1.6°; 3 specimens.

West of Iceland: Stat. 86: Lat. 65°03'6" N., Long. 23°47'6" W., 76 fath.; 1 specimen.

Furthermore it has been gathered at North-East Iceland in Myre Bugt, Lat. 66°11' N., Long. 15°04' W., 33 fath., 2 specimens, by "Beskytteren"; the "Thor" secured it at two localities, viz. East Iceland: Hjerads Floi, 15—25 fath., 3 specimens, and south-west of Iceland: Lat. 63°46' N., Long. 22°56' W., 79 fath., 10 specimens.

Distribution. At Norway gathered off Lofoten, 50—60 fath., and at Finmark near Hasvig and Vadsø 20—40 fath. (G. O. Sars). Furthermore taken at the southern end of Spitzbergen, Lat. 76°19' N., Long. 18°1' E., 142 fath. (G. O. Sars), at Cape Flora, Franz Joseph Land, 10 fath. (Th. Scott), and south of Novaya Zemlya, Lat. 70°20' N., Long. 56°34' and 56°35' E., 48 fath. (Stappers). In the North Sea at Lat. 56°21' N., Long. 5°32' E. (Ehrenbaum), at two places in North-East England, 37 to 57 fath. (Norman and Brady), and in Firth of Forth (Th. Scott). Walker recorded it from the Irish Sea, 33 fath. Finally it has been taken off Newfoundland, 89 fath., and off Marthas Vineyard, 39 fath. (Calman).

Family Lampropidæ.

This family comprises hitherto only a moderate number of species (nearly 30), but as to generic types it is rather well represented in the "Ingolf" area, as 4 among the 8 genera referred by Zimmer to the family are to be mentioned on the following pages.

Lamprops G. O. Sars.

Only a single species is hitherto known from our area.

42. **Lamprops fuscata** G. O. Sars.

1865. *Lamprops fuscata* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1864, p. 192.
!1899. — — G. O. Sars, Account, III, p. 20, Pl. XI.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 154.

Occurrence. Not taken by the "Ingolf". But it has been collected at four localities in West Greenland, all situated between Lat. 69°14′ N. and 68°36′ N. Three of these places have already been recorded by me in 1887, viz. Breddal, Disko, 5 fath.; Godhavn, 8—10 fath., and Nivak, 5—15 fath. The fourth locality is Kronprindsens Eyland, where Mag. sc. Kruuse took a sample of bottom material, in which 2 females were found.

Distribution. At Norway common from Lofoten to Vadsö, shallow water (G. O. Sars). At Novaya Zemlya it was taken in the western outlet of Matotschkin Schar, 8—10 fath. (Stuxberg); at Franz Joseph Land especially in West Bay, 2—10 fath. (Th. Scott); finally off Newfoundland, 67 fath. (Calman). — A few adult females taken at two localities in Alaska have "provisionally" been associated with *L. fuscata* by Calman (1912), but some of the differences from the normal form pointed out by him are in my opinion not unimportant, and I suppose that the specimens from Alaska belong to a separate species.

Hemilamprops G. O. Sars.

Of this genus 6 species have been established, and 3 among them are found in our area.

43. **Hemilamprops assimilis** G. O. Sars.

1883. *Hemilamprops assimilis* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1882, no. 18, p. 55, Tab. 1, Fig. 23—24.
!1899. — — G. O. Sars, Account, III, p. 23, Pl. XV.
1913. — — Stebbing, Das Tierreich, 39. Lief., p. 56.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 3 specimens.

Distribution. First taken at Vardø in East Finmark, 30—50 fath., later besides at two places in West Finmark, 60—200 fath. (G. O. Sars). When Walker (teste Calman) recorded it from the Irish Sea off Co. Cork, I venture to suppose that the determination was not correct.

44. **Hemilamprops uniplicata** G. O. Sars.

1872. *Lamprops uniplicata* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1871, p. 270.
!1899. *Hemilamprops uniplicata* G. O. Sars, Account, III, p. 24, Pls. XVI—XVII.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 58.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 10 specimens (mutilated).

Distribution. West coast of Norway at five places, from Hardanger Fjord to Lofoten 60—150 fath.; rather far from Norway at Lat. 63°10' N., 417 fath., temp. ÷1.0°, and at Lat. 66°41' N., 350 fath., temp. ÷0.9° (G. O. Sars). Besides west of Ireland, 199 fath. (Calman). — Calman states that the species "is recorded, with an indication of doubt, from E. Loch Tarbert (L. Fyne) by Brook and Scott"; its occurrence in that Loch may be possible, but is not very probable.

45. **Hemilamprops cristata** G. O. Sars.

1870. *Lamprops cristata* G. O. Sars, Forh. Vidensk. Selsk. Christiania for 1869, p. 157.
!1900. *Hemilamprops cristata* G. O. Sars, Account, III, p. 25, Pl. XVIII.
1913. — — Stebbing, Das Tierreich, 39. Lief., p. 57.

As Calman points out differences between the telson in most of his specimens and Sars' account, it may be stated, that I have examined the telson in many females and found it to agree with Sars' figure both in shape and in length and number of spines, excepting that sometimes four pairs of lateral spines were found. Calman suspects that *H. Normani* Bonnier will prove to be a synonym to *H. cristata*; it may be possible, but seems to me rather improbable. — It may be mentioned that the Epicarid *Cumoechus insignis* H. J. H. was found in the marsupium of three females from Lat. 61°07', Long. 9°30' W.

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

Davis Strait: Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fath., temp. 3.3°; 2 specimens.

Besides taken by the "Thor" at 4 localities in our area.

South of Iceland: Lat. 63°15' N., Long. 22°23' W., 114—172 fath.; 4 specimens.

— - — Lat. 62°10' N., Long. 19°36' W., 1010—1142 fath.; 6 specimens.

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 12 specimens.

— — — Lat. 61°07' N., Long. 9°30' W., 443 fath.; 84 specimens.

Distribution. Taken four times in Skager Rak between Jutland and Norway, 226—350 fath. (H. J. Hansen); the "Thor" captured it south-west of Norway at Lat. 58°32' N., Long. 4°18' E., 148 fath. At the west coast of Norway in several places from Hardanger Fjord to Lofoten "in depths of more than 100 fathoms" (G. O. Sars), yet in 1886 Sars stated to have gathered it at Husö in 80—100 fath. The "Thor" secured it north-east of Shetland, Lat. 61°14' N., Long. 1°19' E., 85 fath.. Norman recorded it from south of Rockall, Lat. 56°07' N., Long. 14°19' W., 630 fath., and Calman from five stations west of Ireland, 199—382 fath. But when Sars (1900) writes: "British Isles (Robertson)", it can only be founded on a single locality; according to Norman it was in 1860 published by Robertson that this species had been taken in the Firth of Clyde.

Platytyphlops Stebbing.

Of this very interesting genus only 2 species are known, one from each hemisphere. The northern species has been discovered in the "Ingolf" area.

46. **Platytyphlops orbicularis** Calm.

1905. *Platyaspis orbicularis* Calman, Fisheries, Ireland, Sci. Invest., 1904, I, p. 43, Pl. V, figs. 77—81.
!1912. *Paralamprops* — Calman, Proc. U. S. Nat. Mus. vol. 41, p. 631, figs. 29—39.
1913. *Platytyphlops* — Stebbing, Das Tierreich, 39. Lief. p. 158.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61°7′ N., Long. 9°30′ W., 443 fath.; 12 specimens, all mutilated, most of them fragments.

Distribution. The species was established on a specimen gathered west of Ireland: 77 miles W.N.W. of Achill Head, co. Mayo, 382 fath. (Calman). Later it has been recorded from 4 stations situated off the east coast of America, from Lat. 39°54½′ N., Long. 70°20′ W. to Lat. 39°42′ N., Long. 71°32′ W., depths 335—555 fath. (Calman).

Platysympus Stebbing.

Of this fine genus only 2 species are known. One among them, *P. typicus* G. O. Sars, has been taken at the west coast of Norway in some localities from Lofoten to Hardanger Fjord, besides west of Ireland and in the Mediterranean, consequently it might be possible to find it in the southern part of the "Ingolf" area. It has, however, not been discovered there, but I was somewhat surprised in seeing that a couple of specimens of *Platysympus* taken south of Iceland belong to a new species.

47, **Platysympus tricarinatus** n. sp.

(Pl. IV, figs. 3 a—3 c).

Immature Specimens (Male and Female). Carapace (fig. 3 a) seems to be proportionately a little broader than in *P. typicus* G. O. S., and with the lateral margins less converging forwards, but as it is cracked in both specimens some uncertainty as to the outline remains. But a valid difference between it and that in the last-named species is that its surface is adorned with three obtuse but distinct keels, one in the median line, and one about halfway between the median keel and the lateral margin; these sublateral keels cease anteriorly near the end of the fissure separating the pseudorostrum; the surface is a little hollowed along the lateral margins. First free segment differs extremely from that in *P. typicus*; it is scarcely half as broad as the carapace, with each antero-lateral corner produced, curved somewhat forwards and acute, while about the posterior half is strongly narrowed, less than half as broad as the anterior part, and the lateral margins of the segment are therefore very concave. Second free segment without distinct keels.

Antennulæ, the three pairs of maxillipeds and second pair of legs differ only in a few minute particulars from Sars' figures of *P. typicus*; the other cephalothoracic appendages are mutilated. — Uropods (fig. 3 b) nearly as in *P. typicus*; peduncle slightly shorter than the two posterior abdominal segments together and conspicuously longer than the endopod; both peduncle and endopod as in *P. typicus*, but the exopod differs in reaching distinctly beyond the end of second joint of the endopod, while in the other species it does not reach that end. Telson with the proximal part of the lateral margins more convex, while these margins are about at their middle more concave than in *P. typicus*, according to Sars' figure; the end with 3 spines, but a smaller spine is in both specimens observed on one of the coarsely serrated lateral margins near the end.

Length of the young male 5.6 mm, of the female with the marsupium rudimentary 5.7 mm.

Remarks. By the three keels on the carapace and above all by the curious shape of the narrow first free thoracic segment this species differs strongly from *P. typicus*.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South of Iceland: Lat. 62°57' N., Long. 19°58' W., 508 fath.; 2 immature, mutilated specimens.

Family Diastylidæ.

This large family, which is distributed all over the world, is especially represented in the arctic-subarctic and boreal regions by a large number of species; from the "Ingolf" area 19 species are dealt with in the present paper. But some questions as to the limitation of its genera are difficult; certain features frequently used are of slight value as generic characters. For instance, rudimentary exopods in third and fourth pairs of legs in the female are found in *Leptostylis* and wanting in *Diastyloides*, while in *Diastylis* they are wanting in most species, but according to Calman (1912) distinct in some forms. Whether third and fourth free thoracic segments are fused or separated is another feature used as generic character, but it has scarcely been observed that every transition between complete fusion of these segments without vestige of dorsal suture and movable articulation of these segments against one another can be pointed out; a few facts may be mentioned. Sars says that in *Diastylopsis resima* Kr. (referred here to *Brachydiastylis* Stebb.) these two segments "are very firmly connected", but "a well-marked suture may in reality be proved to exist between them"; in *Makrocylindrus spiniventris* n. sp., the suture is distinct on the sides but its transverse part on the dorsal surface is wanting. In the female of the gigantic *Diastylis Goodsiri* Bell these segments are seemingly both dorsally and on the sides well separated, but a closer inspection shows that the furrow between them is firmly chitinized, so that they are immovably coalesced. In *Diastylis polaris* G. O. S. and *Diastylis longicaudata* Bonnier there is a narrow but real, movable articulation between the two segments, especially on the dorsal side; *D. scorpioides* Lep. is intermediate between *D. Goodsiri* and *D. polaris*; in *Diastyloides serrata* G. O. S. and *Leptostylis grandis* n. sp. the articulation is well developed.

Taking these and other difficulties into consideration, I decided as to the genera to follow a middle way between Stebbing and Zimmer. The genus *Adiastylis* Stebb. is not adopted, but *Brachydiastylis* Stebb. is maintained, especially because a new species allied to *B. resima* Kr. shows some of the peculiarities found in that Kroyerian species developed to a still higher degree, so that these two species constitute a natural group. Finally it may be stated here that for reasons to be given later on a new species is referred to *Makrocylindrus* Stebb., though it differs from the diagnosis of this genus in a special feature of the telson. — Five genera are represented in the material.

Diastylis Say.

The collection contains 9 species, one among them new, but an additional species not seen by me was secured by the "Valorous" near Davis Strait, and must of course be included.

48. **Diastylis Rathkii** Kr.

1841. *Cuma Rathkii* Kröyer, Naturh. Tidsskr. B. III, p. 513, 531, Tab. V, VI, Fig. 17—30.
1846. — — Kröyer, Naturh., Tidsskr., Ny Række, B. II, p. 144, 207, Tab. I, Fig. 4 and 6.
— — *angulata* Kröyer, Naturh. Tidsskr., Ny Række, B. II, p. 156, 206, Tab. I, Fig. 2, Tab. II, Fig. 1, a—i [♂].
1849. — *Rathkii* Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. V. fig. 1, a—u.
— — *angulata* Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. V, fig. 2 a—x [♂].
!1900. *Diastylis Rathkei* G. O. Sars, Account, III, p. 44, Pls. XXXIII—XXXIV.
! — — *Rathkei* var. G. O. Sars, Account, III, p. 107, Pls. LXX—LXXII.
1913. — *rathkii* Stebbing, Das Tierreich, 39. Lief., p. 98 (with the enormous synonymy).

It may be mentioned that in the marsupium of females from West Greenland specimens have been found of *Sphæronella decorata* H. J. H., a parasitic Copepod of the family Choniostomatidæ.

Occurrence. Taken by the "Ingolf" at 7 stations.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fath., temp. 3.9°; 8 specimens.
— — Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fath., temp. 3.6°; 11 specimens.
— — Stat. 28: Lat. 65°14' N., Long. 55°42' W., 420 fath., temp. 3.5°; numerous specimens.
— — Stat. 27: Lat. 64°54' N., Long. 55°10' W., 393 fath., temp. 3.0°; 6 specimens.
— — Stat. 25: Lat. 63°30' N., Long. 54°25' W., 582 fath., temp. 3.3°; several specimens.
South-East of Iceland: Stat. 4: Lat. 64°07' N., Long. 11°12' W., 237 fath., temp. 2.5°; 1 specimen.
North-West of the Færoes: Stat. 138: Lat. 63°26' N., Long. 7°56' W., 471 fath., temp. ÷0.6; 7 specimens.

This species is common at West Greenland; already in 1888 I enumerated 17 localities — most of them near the coast and 5 among them more distant from land in Baffin Bay or Davis Strait — between Lat. 72°41' N., and 60° N.; the depths were most frequently from ab. 10 to 50 fath., but six among them from 215 to 410 fath. Later it has been found at two places on the same coast not recorded in the literature, viz. at Egedesminde by Prof. Bergendal, and at Holstensborg (Lat. 66°56' N.) by Mag. Traustedt; Stephensen records it from Northern Strömfjord, ab. Lat. 67°42' N., 30 fath. and 4—11 fath., and from Brede Fjord, ab. Lat. 61° N., 2½—5 and 5—8 fath. Ohlin and Ortmann recorded it from two places very far northwards in West Greenland, viz. Barden Bay, ab. Lat. 77°30' N., 20—25 fath., and Murchison Sound, ab. Lat. 77°30' N., 25 fath.

The "Thor" gathered this species south-west of Iceland: Lat. 63°46' N., Long. 22°56' W., 80 fath.; at East Iceland it has been taken by Dr. A. C. Johansen in Loons Vik, 40 fath. — Norman records it from a place south-west of the Færoes: Lat. 60°31' N., Long. 9°18' W., 229 fath. — At East Greenland it has been captured six times, the IInd Amdrup-Expedition gathered it at ab. Lat. 74°28′ N., Long. 15°36′ W., 110 fath., and in Hurry Inlet, Lat. 70°50′ N., 50 fath. Ohlin recorded it from Lat. 70°43′ N., Long. 22°29′ W., Scoresby Sound, 37 fath., Lat. 72°28′ N., Long. 21°48′ W., 95 fath., and Lat. 74°52′ N., Long. 17°16′ W., 186 fath. Finally taken by the Duc d'Orléans near Lat. 75°58′ N., Long. 14°08′ W., 150 fath.

Distribution. Found in some parts of Kattegat, common in both Belts and also going through the Sound to the Baltic, where it has been taken in the Bay of Kiel, off Bornholm and eastwards to Gotland (various authors); it occurs generally in the deeper tracts of the named areas, is rare in 7—8 fath., though yet found in 3½ fath. In Skager Rak it was secured several times in 35 to 110 fath., but also taken in ab. 220 and 350 fath. (H. J. Hansen). It occurs along the whole coast of Norway, generally in 10 to 30 fath. (G. O. Sars), was taken between Greenland and Spitzbergen at Lat. 81°00′ N., Long. 1°00′ E., 540 fath. (G. O. Sars), and a few times at western and northern Spitzbergen, northwards to Lat. 81°20′ N., in depths from 80 to 531 fath. (Sars, Ohlin, Zimmer). Furthermore it was recorded from Franz Joseph Land (Heller, Th. Scott), from places in the Barents Sea, 60 and 120 fath. (Hoek, Stuxberg), from places at the west and south coasts of Novaya Zemlya, Matotschkin Schar and Jugor Schar in depths from 4—10 fath. and down to 30—70 fath. (Stuxberg, Stappers), from several places in the Kara Sea in depths from 3 to 60 fath. (Stuxberg, H. J. Hansen), besides in the Sibirian Ocean at Long. 78°40′ E., 26 fath., at Long. 80°58′ E., 5 fath., and at several places between Cape Tchélyuskine and Long. 173°24′ W., near Bering Strait, 3 to 12 fath. (Stuxberg).

G. O. Sars recorded this species from two stations in the cold deep sea area west of Norway, viz. Lat. 69°46′ N., Long. 16°15′ E., 649 fath., temp. ÷ 0.7°, and Lat. 62°44′ N., Long. 1°48′ E., 412 fath., temp. ÷ 1.0°. It is common in the North Sea southwards to the Belgian coast, has been found at places on the eastern and western coast of Scotland and England and at the south coast of Devon and Cornwall (various authors), but is unknown from the west side of Ireland (Calman). It has been taken at Port Kennedy (Bate, as *D. borealis*), at five places at the east coast of Baffin Land between Lat. 73°43′ N. and Lat. 71°42′ N. in 5—10 and down to 10—28 fath., and at Lat. 66°33′ N., 6 fath. (Ohlin), in places at Labrador in depths from 7 to 50 fath., at some stations off Halifax and the east coast of America southwards to Lat. 41°11½′ N., 20 to 499 fath. (S. I. Smith; Calman); finally at Point Franklin on the east side of Bering Strait (Murdoch), and at a number of places at Alaska and the Aleutian Islands southwards to Sitka, in depths from 5—7 and down to 15—20 fath. (Calman).

The distribution of this species is very interesting. It is really circumpolar and goes southwards to the southern coast of Cornwall; it is generally found in depths from 10 to 50 fath., but has been taken in 3 fath., and several times in depths from 300 to 649 fath. Furthermore it seems rather independent both of salinity and temperature, because it goes far eastward in the Baltic and has been captured not only in 300 to 582 fath. at stations belonging to the warm area, but also by Sars and the "Ingolf" in 412, 471 and 649 fath. at stations belonging to the cold deep-sea area[1]. Extremely few, if any, other species of Malaco-

[1] Here a special point may be mentioned. Ohlin imputes me to have committed an error in 1888 in saying that *D. Rathkii* had been recorded by Norman from the entrance of Davis Strait, 1750 fath., but I said that *D. Rathkii* had been taken at West Greenland in every depth down to 410 fath., the greatest depth where dredging had been undertaken, excepting that by Norman in 1750 fath. Consequently I did not include 1750 fath. as a locality for this species.

straca have a so wide geographical distribution together with so great independence of depth, temperature and salinity of water.

49. **Diastylis lucifera** Kr.

1841. *Cuma lucifera* Kröyer, Naturh. Tidsskr. B. III, p. 527, 531, Tab. VI, Fig. 34—35.
1848. — — Kröyer, Naturh. Tidsskr. Ny R, B.. II, p. 171, 207.
1849. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. III, fig. 3, a—k.
1900. *Diastylis* — G. O. Sars, Account, III, p. 49, Pl. XXXVIII.
1913. — *lucifer* Stebbing, Das Tierreich, 39. Lief. p. 101.

Occurrence. Taken by the "Ingolf" at 4 stations.

Davis Strait: Stat. 31: Lat. 66°35′ N., Long. 55°54′ W., 88 fath., temp. 1.6°; 1 specimen.
— — Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 18 specimens.
— — Stat. 35: Lat. 65°16′ N., Long. 55°05′ W., 362 fath., temp. 3.6°; 14 specimens.
— — Stat. 28: Lat. 65°14′ N., Long. 55°42′ W., 420 fath., temp. 3.5°; 11 specimens.

Distribution. Distributed in the major part of Kattegat, entering the northern half of the Sound and going through Store Belt into Langelands Belt; the depths generally 12 to 30 fath., a single time only 8 fath.; furthermore frequently captured in Skager Rak in depths from 35 to 350 fath. (Meinert, H. J. Hansen). It is rather common along the whole coast of Norway, from the innermost part of Christiania Fjord to Vadsö, in 20 to 50 fath. (G. O. Sars). It is rather common in the major part of the North Sea, in the eastern part southwards at least to Lat. 55° (Ehrenbaum), while in its western tracts it has been taken near Aberdeen, in Firth of Forth (Th. Scott) and at some places at Northumberland and Durham, 25 to 59 fath. (Norman and Brady); Norman records it from a place near Plymouth. Calman records it from off Newfoundland, 206 fath., and from the Gulf of Maine, 54 fath.; S. I. Smith possessed it from the Bay of Fundy, 60 and 77 fath.; Whiteaves from the Gulf of St. Lawrence.

50. **Diastylis hastata** n. sp.

(Pl. IV, figs. 4 a—4 e).

Adult Female (and immature Male). Cephalothorax, not including pseudorostrum, rather oblong both from above and from the side, nearly as slender as *D. Rathkii*. Carapace moderately vaulted above, and two-thirds of its dorsal margin somewhat sloping, especially anteriorly; major anterior part of the dorsal surface with a good number of irregularly distributed small or rather small spinules, and several such spines are also found on the anterior part of the sides; ocular lobe with a few minute denticles; the whole lower margin adorned with a close row of teeth which are long on the anterior part and also found on the posterior part of the pseudorostral projection, while on about the posterior two-thirds of the margin the teeth are conspicuously shorter but not more slender, and towards the hind margin they are subquadratic. Pseudorostrum extremely long, only somewhat or even a little shorter than the carapace from the front end of the ocular lobe to the posterior margin, considerably upturned, tapering regularly to the subacute end, with the upper margin, seen from the side, very feebly convex, while half of the lower margin has a small number of remote, minute saw-teeth, and the posterior part of this margin is, as already mentioned, armed with strong and closely set teeth rapidly increasing in length to below the insertion of the antennulæ. Free thoracic segments rather considerably shorter than the carapace, last segment with two pairs of sublateral denticles, and sometimes also a pair of denticles on fourth segment; postero-lateral angle of last segment scarcely produced. Abdomen somewhat slender, the two anterior segments each with a pair of sublateral denticles, and sometimes also a pair of denticles on fourth segment; fifth segment long, almost twice as long as the sixth, with about four pairs of sublateral denticles on its posterior third; sixth segment with a pair of sublateral denticles near the posterior margin.

Antennulæ (fig. 4 a) very long, as the peduncle is almost as long as pseudorostrum; its first joint seen from below about as long as the second, with a somewhat long tooth below and a similar tooth on the inner side at the end; third joint somewhat shorter than the second; upper flagellum considerably shorter than third peduncular joint, 3-jointed; lower flagellum shorter than first joint of the other flagellum, 3-jointed. Antennæ with a thin and moderately long, plumose seta on the end of the terminal joint; mandibles as in *Diastylis* sens. Sars. Third pair of maxillipeds normal, second joint a little broader and proportionately shorter than in *D. Rathkii*, and armed with several teeth along the distal part of its inner margin; ischium with a tooth on the inner margin, and merus with a tooth below; the long proximal joint of the exopod without teeth. First pair of legs (fig. 4 b) moderately long, stretched forwards reaching scarcely to the end of the antennular peduncles; second joint with about 7 strong teeth on the distal half of the inner margin and the same number of teeth below near the outer margin; propodus a little shorter than the carpus and much longer than the dactylus; the long proximal joint of the exopod with a number of teeth on the middle part of its outer margin. Second pair of legs (fig. 4 c) a little more than half as long as first pair, second joint with a few teeth on the inner margin and some teeth on the lower side; ischium with a somewhat small tooth on the inner corner; carpus about twice a long as the dactylus; the long proximal joint of the exopod with fine teeth on half of the outer margin. Third and fourth pairs of legs without exopods; fourth pair (fig. 4 d) with the carpus about twice as long as the two distal joints together. — Uropods somewhat long, peduncle in the adults almost as long as the two posterior abdominal segments together, with 6 or 7 spines on the inner margin; in subadult specimens without marsupium or with its plates small the peduncle is somewhat shorter (fig. 4 e) than the two abdominal segments together and with 6 marginal spines; rami long, as the exopod is only somewhat shorter than the peduncle and somewhat or rather little longer than the endopod, which is slender, 3-jointed, its first joint as long as the two distal joints combined, with 6 or 5 marginal spines in the adult, 5 or 4 such spines in subadult specimens; second joint longer than the third and with 2, or in the adult 3, marginal spines. Telson not much shorter than the peduncle of the uropods; its slender part is conspicuously longer than the thickened proximal portion, with 5 pairs of lateral spines; the terminal spines are longer and thicker than the lateral ones.

Length of the females with marsupium 6 mm.

Remarks. This interesting species is a typical *Diastylis*, excepting in having the pseudorostrum extremely long, even proportionately longer than in any other species of the order.

Occurrence. Gathered by the "Ingolf" at two deep stations in the warm area.

Davis Strait: Stat. 24: Lat. 63°06' N., Long. 56°00' W., 1199 fath., temp. 2.4°; numerous specimens.
— — Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 4 specimens.

51. **Diastylis Goodsiri** Bell.

1855. *Alauna Goodsiri* Bell, Belcher's Last of the Arct. Voy. Vol. II, p. 403, Pl. XXXIV, figs. 2, 2 a—q.
!1886. *Diastylis Goodsiri* H. J. Hansen, Dijmphna-Togtets zool.-bot. Udbytte, p. 241, Tab. XXII, Fig. 5—5 n; Tab. XXIII, Fig. 1—1 e.
!1900. — — G. O. Sars, Account, III, p. 54, Pl. XLI.
1913. — *goodsiri* Stebbing, Das Tierreich, 39. Lief. p. 99.

Occurrence. Taken by the "Ingolf" at 3 stations.

Davis Strait: Stat. 32: Lat. 66°35' N., Long. 56°38' W., 318 fath., temp. 3.9°; 3 specimens.
— — Stat. 35: Lat. 65°16' N., Long. 55°05' W., 362 fath., temp. 3.6°; 4 specimens.
South of Jan Mayen: Stat. 115: Lat. 70°50' N., Long. 8°29' W., 86 fath., temp. 0.1°; 12 specimens.

Ortmann and Ohlin recorded it from two localities in the most northern West Greenland, viz. Foulke Fjord (Lat. 78°18' N.) 15—20 fath., and Murchison Sound (ab. Lat. 77°30' N.) 50 fath.

Furthermore it is known from two places in Davis Strait, viz. Lat. 66°45' N., Long. 56°30' W., ab. 200 fath. (K. Stephensen), and Lat. 65°35' N., Long. 54°50' W., 80 fath. (H. J. Hansen); besides taken in Bredefjord, West Greenland, at Lat. 60°45' N., 133—148 fath., and ab. 6 miles further south in Skovfjord, $34^1/_2$—48 fath. (K. Stephensen).

At Iceland this species has been gathered a few times; on the north-western side it was taken by the "Thor" in Onundar Fjord, 12—0 fath.; on the northern side by Admiral Wandel in Skagestrands Bugt, 119 fath., temp. 2.9°, and by the "Thor" off Husavik, 43 and 48—53 fath.; at the east coast by the "Thor" in Røde Fjord, 74 fath. — The IInd Amdrup-Expedition collected it at Jan Mayen, ca. 55 fath., and at two places off East Greenland, viz. in Hurry Inlet, Lat. 70°50' N., 7—0 fath., 2 large females, and at ab. Lat. 74°28' N., Long. 15°36' W., 110 fath., 1 large female. Ohlin recorded it from four places at East Greenland between Lat. 70°43' N., and Lat. 74°10' N., depths 13—21 to 106 fath.

Distribution. Taken at the north-western side of Norway, in Fjords near Tromsø at ab. Lat. $69^1/_2$ N., further north in Porsanger Fjord, and at the east coast in Varanger Fjord at Vadsø, ab. 60 fath. (G. O. Sars). It is recorded from several places off Spitsbergen or in its Fjords or Sounds, 34—125 fath. (G. O. Sars, Ohlin, Zimmer); furthermore from Barents Sea, 148 fath., temp. ÷ 1.4° (G. O. Sars), and from 8 other places in the same sea, 40 to 198 fath. (Hoek). Stuxberg recorded it from Matotschkin Schar, 5—15 and 30—70 fath.; in the Kara Sea it is common, taken in 16 to 40 fath. (Stuxberg, H. J. Hansen), and it has been found in the Sibirian Polar Sea eastwards to Lat. 76°52' N., Long. 116°0' E., 20 to 40—50 fath. (Stuxberg). Calman records it from five stations situated somewhat south-east of Cape Sable, Nova Scotia (at ab. Lat. 43°) northwards to Lat. 47°40', Long. $47°35^1/_2$' W., in depths from 70 to 218 fath.; Ohlin possessed it from the west side of Davis Strait at Lat. 66°33', 6 fath., and from three places at the east coast of Baffin Land between Lat. 71°57' N., to Lat. 72°38' N., 5—20 to 10—28 fath. The type specimens were taken in Wellington Strait, ab. Lat. 75° N., Long. 93° W.

52. **Diastylis polaris** G. O. Sars.

1872. *Diastylis polaris* G. O. Sars, Öfv. Kgl. Sv. Vet.-Akad. Förh. Årg. 38, p. 797.
1872. — *stygia* G. O. Sars, l. c. p. 798.
1873. — *polaris* G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Foljd. Bd. 11, no 6, p. 4, Tafl. I, Fig. 1—3.
1873. — *stygia* G. O. Sars, l. c. p. 6, Tafl. II, Fig. 4—7.
1887. — — G. O. Sars, Challenger Rep. Vol. XIX, II, p. 44, Pls. VI—VIII.
1901. — *polaris* Ohlin, Bihang K. Sv. Vet.-Akad. Handl. Bd. 26, IV, no. 12, p. 50.
1913. — *stygius* and *polaris*, Stebbing, Das Tierreich, 39. Lief. p. 100.

More than a year before Ohlin cancelled *D. stygia* as a synonym to *D. polaris* I had arrived at the same result while determining the "Ingolf" material, viz. the specimens from Stat. 25 in the warm area and from the stations in the cold area. I found that two or three oblique rugæ were always more or less developed on the carapace, which is a character for *D. polaris*, while in females without marsupium and in immature males (adult males are unknown) each of the three anterior free thoracic segments has in the median ventral line a more or less developed denticle, and many, but not all, specimens have an erect, fine, spiniform denticle above on the last thoracic segment, but both these features are according to Sars (in 1872) characters for *D. stygia*. From Stat. 36 (1435 fath., in the warm area) three young specimens with the last pair of legs still wanting were put aside for future study, these specimens are proportionately large, the largest measuring 8 mm. in length, while specimens without last pair of legs from the cold area or from 582 fath. in the warm area are only about 5.8 mm long. When in 1919 the present paper was worked out, the material was again examined; I found that the young specimens from Stat. 36 have no vestige of oblique rugæ on the carapace and agree on the whole well with Sars' first description of *D. stygia*, excepting in possessing not a single spine but two spines in the median dorsal line of last thoracic segment, the first spine larger than the second, and Sars describes two such spines in his "Challenger" specimens. According to Sars first pair of legs are shorter in *D. stygia* than in *D. polaris*, and in the three specimens without rugæ the carpus of these legs is rather far from reaching the end of pseudorostrum — but in young specimens from the cold area with rugæ but still without last pair of legs, first legs show the same feature, because they are proportionately shorter in such young than in subadult or adult specimens. — The result is that I must consider absence of rugæ in the young specimens from Stat. 36 as mere variation, that *D. polaris* and *D. stygia* are the same species, which shows some variation, partly individual, partly according to localities. If *D. stygia* shall be kept as a separate form, the only character hitherto observed seems to be the absence of rugæ on the carapace — and of the "Ingolf" material only the specimens from Stat. 36 have no rugæ.

It may be mentioned that the Epicarid *Cumoechus insignis* H. J. H. was found in the marsupium of specimens from the "Ingolf" Stat. 113 and 138.

Occurrence. Taken by the "Ingolf" at 12 stations.

Davis Strait: Stat. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fath., temp. 3.3°; 16 specimens, the major part mutilated and young.

Davis Strait: Stat. 36: Lat. 61°50' N., Long. 56°21' W., 1435 fath., temp. 1.5°; 3 very young specimens.

North of Iceland: Stat. 124: Lat. 67°40' N., Long. 15°40' W., 495 fath., temp. ÷ 0.6°; 1 specimen.

East of North Iceland: Stat. 102: Lat. 66°23' N., Long. 10°26' W., 750 fath., temp. ÷ 0.9°; 5 specimens.

— - — — Stat. 104: Lat. 66°23' N., Long. 7°25' W., 957 fath., temp. ÷ 1.1°; 4 specimens.

North-East of Iceland: Stat. 120: Lat. 67°29' N., Long. 11°32' W., 885 fath., temp. ÷ 1.0°; 9 specimens.

— - — Stat. 119: Lat. 67°53' N., Long. 10°19' W., 1010 fath., temp. ÷ 1.0°; 5 specimens.

South of Jan Mayen: Stat. 118: Lat. 68°27' N., Long. 8°20' W., 1060 fath., temp. ÷ 1.0°; 1 specimen.

— - — — Stat. 117: Lat. 69°13' N., Long. 8°23' W., 1003 fath., temp. ÷ 1.0°; 10 specimens.

— - — — Stat. 113: Lat. 69°31' N., Long. 7°06' W., 1309 fath., temp. ÷ 1.0°; ab. 30 specimens.

— - — — Stat. 116: Lat. 70°05' N., Long. 8°26' W., 371 fath., temp. ÷ 0.4°; 1 specimen.

North of the Færoes: Stat. 139: Lat. 63°36' N., Long. 7°30' W., 702 fath., temp. ÷ 0.6°; 6 specimens.

Finally captured by the "Lightning" south-west of the Færoes: Lat. 60°31' N., Long. 9°18' W., 229 fath. (A. M. Norman, and determined by him as *D. polaris*). Sars recorded *D. polaris* from two places within the "Ingolf" area, viz. East of Iceland: Lat. 65°53' N., Long. 7°18' W., 1163 fath., temp. ÷ 1.1°, and between Iceland and Jan Mayen: Lat. 69°2' N., Long. 11°26' W., 1004 fath., temp. ÷ 1.1°.

Distribution. Sars' type of *D. polaris* was taken west of North Spitzbergen: Lat. 80° N., Long. 4°33' E., 950 fath.; his type of *D. stygia* was taken between Spitzbergen and Greenland at Lat. 78° N., Long. 2°27' W., and the depth was stated to be 2600 fath., but Ohlin says that this is an exaggeration, as the greatest depth measured by modern and exact methods in the so-called "Swedish depth" is 3200 m., or ab. 1700 Danish fathoms. Besides the two above-named stations Sars recorded *D. polaris* from four and *D. stygia* from three stations, all situated in the cold area west of Norway and further north to west of Spitzbergen, between Lat. 63°17' N., and Lat. 77°58' N., 350 to 1333 fath. Ohlin recorded it from three places west and south-west of Spitzbergen with great depths, down to 1434 fath., temp. ÷ 1.3 to ÷ 1.4°. Sars mentioned *D. stygia* from Lat. 41°14' N., Long. 65°45' W., off Nova Scotia, 1340 fath.; Calman records what he considers as *D. stygia* from twelve places off the east coast of the Un. States between Lat. 41°28$^1/_2$' N. and Lat. 37°25' N., depths from 1149 to 1813 fath. (a station with 146 fath. is with good reason suspected by Calman as an error.) — Norman referred with some uncertainty a couple of immature specimens from Lat. 48°50' N., Long. 11°9' W., 725 fath., to *D. stygia*, but one or two of features observed by him makes the determination somewhat questionable.

53. **Diastylis scorpioides** Lepechin.

1780. *Oniscus scorpioides* Lepechin, Acta Acad. Sc. Imp. Petropol., 1778, vol. I, p. 148, Tab. 8, fig. 2 (teste Stebbing).
1841. *Cuma Edwardsii* Kröyer, Naturh. Tidsskr. B. III, p. 504, 531, Tab. V, Fig. 1—16.
1846. — — Kröyer, Naturh. Tidsskr. Ny Række, B. II, p. 128, 207, Tab. I, Fig. 1, 1*, 3, 5, 9—14.
— — *brevirostris* Kröyer, l. c. p. 174, 208, Tab. II, Fig. 6 [♂].
1849. — *Edwardsii* Kröyer, in Gaimard; Voy. en Scand., Crust., Pl. IV, fig. 1, a—o.
— — *brevirostris* Kröyer, l. c. Pl. V A, fig. 1, a—t. [♂].
!1900. *Diastylis scorpioides* G. O. Sars, Account, III, p. 58, Pl. XLIV.
1911. — — Stappers, Camp. arct. Duc. d'Orléans, Crust. Malac. p. 112, Pl. IV, figs. 2—6, 11, 12.
1913. — — Stebbing, Das Tierreich, 39. Lief. p. 102.

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

Entrance of Brede Fjord, West Iceland: Stat. 86: Lat. 65°03',6 N., Long. 23°47',6 W., 76 fath., 1 specimen.

D. scorpioides is common at West Greenland. Ortmann recorded it from Barden Bay, 20—25 fath., and Robertson Bay, 5—15 fath., both places at ab. Lat. 77°30' N., and besides from Granville Bay, ab. Lat. 77° N., 20—30 fath.; Ohlin mentioned it from Murchison Sound, ab. Lat. 77°30' N., 50 fath.; Calman from Upernivik, Lat. 72°47' N., 13 fath. In 1888 the present author enumerated it from ten localities at or off West Greenland between Lat. 71°10' N., and Lat. 63°35' N., depths from 8—10 to 200 fath.; in 1890 Prof. Bergendal secured it at two new localities, viz. Jakobshavn, Lat. 69°13' N., 10 fath., and Egedesminde, Lat. 68°42' N.; later K. Stephensen recorded it from Nordre Strømfjord, ab. Lat. 67°40' N., depths from 4—11 and down to 27 fath., and from Bredefjord, ab. Lat. 60°45' N., together with the more southern Skovfjord, depths from 5—8 and down to 120—153 fath.

On the northern side of Iceland this species has been taken by "Beskytteren" in Skjalfándi, 21 fath., and by the "Thor" off Husavik, 42—53 fath.; on the east side of Iceland, by Dr. A. C. Johansen in Bakke Fjord, 20—28 and 52—43 fath., and in Loons Vik, 40 fath.; by Mag. R. Hørring in Faskruds Fjord, 50—20 fath.

The IInd Amdrup Expedition secured it at Jan Mayen, 50—60 and 55 fath., — at this island it has been taken by Prof. Nathorst in 7—11 and 12 fath. (Ohlin) — and in four places at East Greenland between Lat. 69°30' N., and Lat. 74°17' N., viz. Cape Dalton, 9—11 fath., Turner Sound, 3 fath., Hurry Inlet, 10 fath. and 7—0 fath., finally Cape Borlase Warren, 10 fath. It is on the whole common at northern East Greenland; in 1913 K. Stephensen puts together the statements published by Ohlin, H. J. Hansen and himself; he enumerates ten places between Lat. 70°27' N. and Lat. 76°45' N., and in most of these localities the depths were between 1 and 10 fath., the greatest depth 18—32 fath.

Distribution. Found at several places in North Norway, going southwards to Salten Fjord, ab. Lat. 67¼° N. (G. O. Sars).[1] Furthermore taken at some places on the east side of Spitzbergen, in 7—8

[1] In 1913 K. Stephensen wrote »Helgoland (Ehrenbaum, 1895)«. Ehrenbaum has in his faunistic list (1897) not *D. scorpioides*, and it certainly does not live at Heligoland; an error must exist, but its origin may be difficult to trace.

and down to 53—58 fath. (Zimmer, Ohlin); in the Murman Sea (Breitfuss); at a number of places on the west and south coast of Novaya Zemlya and in the straits to the Kara Sea, 4—6 and down to 30—70 fath. (Stuxberg, Stappers); in the Kara Sea and eastwards in the Sibirian Polar Sea to Long. $80^1/_2$° E., 10 to 50 fath. (Stuxberg).

From Arctic America it is recorded by Sars, viz. from Jones Sound, Lat. 76°29′ N., Long. 84°04′ W., and from Smith Sound, Rice Strait; Ohlin possessed it from three places on the east coast of Baffin Land between Lat. 72°38′ N. and Lat. 71°57′ N., 5—10 and down to 10—28 fath. Calman records it from near Nain, Labrador, and from off Newfoundland, Lat. 47°40′ N., 206 fath.

Thus *D. scorpioides* is an arctic species, which generally has been taken in shallow water, but sometimes occurs in 50 to 150 fath., and the greatest depth recorded is 206 fath.

54. **Diastylis spinulosa** Heller.

1875. *Diastylis spinolosus* Heller, Denkschr. Math. Nat. Classe Akad. Wissensch. in Wien, B. XXXV, p. 28, Taf. I, Fig. 5.

1885. — *nodosa* G. O. Sars, Norw. North.-Atl. Exp. Crust. I, p. 61, Pl. VII, figs. 1—4.

!1900. — *spinulosa* G. O. Sars, Account, III, p. 55, Pl. XLII.

1901. — — Ohlin, Bihang K. Sv. Vet.-Akad. Handl. Bd. 26, IV, no. 12, p. 47, Pl. VI, figs. 10 a—d.

1913. — *spinulosus* Stebbing, Das Tierreich, 39. Lief., p. 94.

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

Davis Strait: Stat. 31: Lat. 66°35′ N., Long. 55°54′ W., 88 fath., temp. 1.6°; 1 specimen.

East of Iceland: Stat. 101: Lat. 66°23′ N., Long. 12°05′ W., 537 fath., temp. ÷0.7°; 1 specimen.

It has been recorded from Murchison Sound, West Greenland, 50 fath. (Ohlin), and from four places off West Greenland in Baffin Bay and Davis Strait between Lat. 71°10′ N. and Lat. 65°11′ N. (H. J. Hansen; K. Stephensen). The IInd Amdrup-Expedition secured it two times at East Greenland, viz. north of Stewart Land, ab. Lat. 70°30′ N., 158 fath., and at ab. Lat. 74°28′ N., Long. 15°36′ W., 110 fath.; Ohlin recorded it from Hurry Inlet, Scoresby Sound, Lat. 70°43′ N., 37 fath.

Distribution. At Norway taken only in Porsanger Fjord and Varanger Fjord, thus the most northern and north-eastern Fjords, in about 100 fathoms. (G. O. Sars). Sars recorded it from a station somewhat north-east of Varanger, Lat. 70°36′ N., Long. 32°35′ E., 148 fath., temp. 1.9°; and from a more northern station: Lat. 73°25′ N., Long. 31°30′ E., 197 fath., temp. 2.2°; Ohlin recorded it from Lat. 73°27′ N., Long. 23°11′ E., 247 fath., temp. 2.67°. It has been taken seven times at both sides of Spitzbergen, northwards to Lat. 81°14′ N., in depths from 5 to 231 fath. (Zimmer, Ohlin, G. O. Sars); furthermore five times in Barents Sea, between Long. 22°30′ E., and 45°18′ E., 120 to 220 fath. (Hoek); between Franz Joseph Land and Novaya Zemlya (Heller); in Matotschkin Schar from 5—15 and down to 30—70 fath. (Stuxberg); in the Kara Sea from 32 to 89 fath. (Stuxberg, H. J. Hansen), and somewhat more eastwards in the Polar Sea to ab. Long. 83°8′ E. in 22 to 26 fath. (Stuxberg). Finally it has been recorded by Ohlin from the east side of Baffin Land: Lat. 72°8′ N., Long. 74°20′ W., 10—28 fath. — When Lo Bianco records it from the Mediterranean, it must be due to a wrong determination.

55. **Diastylis echinata** Bate.

1865. *Diastylis echinata* Bate, Ann. Mag. Nat. Hist. Ser. 3, Vol. XV, p. 81, Pl. I, fig. 1.
!1909. — — G. O. Sars, Account, III, p. 57, Pl. XLIII.
1913. — *echinatus* Stebbing, Das Tierreich, 39. Lief. p. 104.

It may be mentioned that the Epicarid *Cumoechus insignis* H. J. H. was found in the marsupium of two specimens from Lat. 61°07′ N., Long. 9°30′ W.

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

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 3 specimens.
— — Stat. 25: Lat. 63°30′ N., Long. 54°25′ W., 582 fath., temp. 3.3°; 3 specimens.

Besides captured by the "Thor" at 3 places within the "Ingolf" area.

South of Iceland: Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; 1 specimen.
South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 38 specimens.
— — — Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 19 specimens.

Distribution. Taken some few times in Skager Rak in depths from 110 to 350 fath. (Meinert, H. J. Hansen). At Norway distributed along the coast from Christiania Fjord to Hasvig in West Finmark, 100 to 417 fath. (G. O. Sars). Zimmer recorded it from north of Spitzbergen, Lat. 81°20′ N., Long. 20°30′ E., 531 fath., which is somewhat surprising. Sars recorded it from off Norway in the cold area at two stations, viz. Lat. 66°41′ N., Long. 6°59′ E., 350 fath., temp. ÷ 0.9°, and Lat. 63°10′ N., Long. 5°0′ E., 417 fath., temp. ÷ 1.0°. Bates' type was taken off Shetland, and Norman recorded it from a place south-east of the Færoes, Lat. 60°10′ N., Long. 5°59′ W., 550 fath. Calman mentions it from a place west of Ireland, 199 fath.[1]

56. **Diastylis longicaudata** Bonnier.

(Pl. IV, fig. 5 a).

!1896. *Leptostylis longicaudata* Bonnier, Ann. l'Univers. Lyon, vol. XXVI, p. 557, Pl. XXX, fig. 2 a—o.
1913. *Adiastylis longicaudatus* Stebbing, Das Tierreich, 39. Lief., p. 115.

Bonnier established this species on an immature female a little less than 10 mm. long. Three specimens from a single locality I refer to this form, though they differ in some particulars from his description. The two largest specimens are females with the marsupium half developed and measuring 8.1 mm.

The carapace agrees in outline completely with Bonnier's figure, and it is, as described by him, studded with innumerable denticles which, for the rest, differ considerably in size; the anterior half of the lateral margin behind pseudorostrum is finely serrated with obtuse teeth, and this serration is partly indicated in Bonnier's figure. The shape of the thoracic segments and abdomen, the antennulæ, the third pair of maxillipeds with a thick spine on the lower side of merus, the small but very distinct, biarticulated exopods

[1] In »Fauna Arctica« Zimmer refers *D. spinosa* Norman (1869) as a synonym to *D. echinata*, which is wrong (*D. spinosa* is the male of *D. Rathkii*), but the result is that in his list of distribution the reference to Norman in 1869 and to Metzger, Möbius and Ehrenbaum on the occurrence of *D. echinata* in the North Sea must be cancelled. That Zimmer's statement »dänische Gewässer, 550 F. (Norman 1894)« is wrong is easily seen, as no such depth is to be found near Denmark, but he has designated Norman's locality, the Færoe Channel, as »dänische Gewässer.«

on third and fourth parts of legs agree perfectly with Bonnier. But the differences in various minor features ought to be pointed out.

1) Bonnier does not mention or figure any spine on the upper surface of the free thoracic segments, and he stated that the abdominal segments are "inermes"; in my two largest specimens the last thoracic segment has a single median dorsal denticle, and some small denticles are perceived on the upper side of the three, especially of the two, anterior abdominal segments. 2) On the distal joints in first pair of legs Bonnier says: "le dactylopodite, un peu plus long que le propodite", and this agrees with his fig. 2 *m*, but in the single leg preserved in my specimens the dactylus, measured by micrometer, is a little shorter than the propodus; it may be added that in Sars' Account the dactylus in the forms belonging to this family is never longer and most frequently distinctly or considerably shorter than the propodus, and therefore I suppose that Bonnier's statement is due to a casual variation or anomaly in his specimen. 3) In one of my specimens the telson has some minute teeth on the proximal third of the lateral margin, but in the other specimen such teeth are scarcely discernible; in Bonnier's figure the telson has no lateral teeth. 4) Finally the French author says that the peduncle of the uropods has 7 spines on the distal half of the inner margin, but in a specimen I found on that margin 13 or 14 small spines — some of spines are lost, but their places of insertion distinct; (the rami are unfortunately mutilated or lost in my specimens). — The differences pointed out between Bonnier's representation and my animals are scarcely of specific value, but only variation.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61°15′ N., Long. 9°35′ W., 463—515 fath.; 3 specimens.

Distribution. The type was taken in the Bay of Biscay: Lat. 44°36′ N., Long. 4°25′ W., 345 fath. (Bonnier).

57. **Diastylis armata** Norman.

1879. *Diastylis armata* Norman, Ann. Mag. Nat. Hist. Ser. 5, Vol. III, p. 64.

1913. — *armatus* Stebbing, Das Tierreich, 39. Lief. p. 95.

Of this evidently rather characteristic species only the type specimen is known.

Occurrence. The single specimen was taken by the "Valorous" at the entrance of Davis Strait, Lat. 59°10′ N., Long. 50°25′ W., 1750 fath. (Norman).

Makrocylindrus Stebbing.

This genus was established in 1912, and *M. fragilis* Stebb. — from off Cape Natal — may be considered the generic type. The only distinctive character between *Makrocylindrus* and some species of *Diastylis* is that the telson has no lateral spines on the narrow and rather short distal part, but only the normal two apical spines. From Stebbing's representation of *M. fragilis* Zimmer points out another and more important generic character, viz. the remarkable reduction of the basal fan of second maxillipeds in adult females, but at present it is, as Zimmer says, not known whether this reduction is found in females of the other forms referred by Stebbing to this genus.

Our knowledge of the 3 or 4 European species of *Makrocylindrus*, viz. *M. serricauda* Th. Scott, *M. dubius* Bonn., *M. Josephinæ* G. O. S. (and *M. erinaceus* G. O. S.), together with *Diastylis longicaudata* Bonn., *D. longipes* G. O. S., *D. costata* Bonn. and *D. armata* Norm. is insufficient. These animals, which all have the thick part of the telson long and cylindrical, the narrow part rather short with three pairs of lateral spines or without spines, are not common, their integument is fragile and consequently damaged, they are more or less spiniferous, and this armature shows some variation, adult females have not been dissected and adult males are unknown. Under these circumstances it is sometimes not possible to refer specimens with certainty to species already described, or in every case to establish an absolutely valid new species, and the reference of species to a genus as *Makrocylindrus* must be provisional, as its diagnosis ought to be revised.

The material from our area comprises one of the species referred by Stebbing to *Makrocylindrus*, and besides a few specimens of a species which may be considered as new; this new species differs materially from Stebbing's diagnosis of the genus in possessing 3 pairs of dorsal spines on the distal part of telson, but as it in the shape of the carapace, the uropods, etc. seems to be related to the South African *M. fragilis*, it is provisionally referred to the present genus.

58. Makrocylindrus Josephinæ G. O. Sars.

1871. *Diastylis Josephinæ* G. O. Sars, Öfv. Kgl. Sv. Vet.-Akad. Förh. Årg. 37, p. 77.
!1871. — — G. O. Sars, Kgl. Sv. Vet.-Akad. Handl. Ny Följd, Bd. 9, no. 13, p. 36, Tafl. XV, Fig. 72—74.
1905. — — Calman, Fisheries, Ireland, Sci. Invest., 1904, I, p. 44.
1913. *Makrocylindrus Josephinæ* Stebbing, Das Tierreich, 39. Lief. p. 120.

Of this species I have examined 3 specimens, one from the "Ingolf" area, the others from more southern localities. In two females without marsupium somewhat more than the proximal half of the thick part of telson is serrated on the sides, in a female with marsupium half developed the saw-teeth on the sides are very small; in all three specimens the narrow part of the telson is completely smooth, while about the proximal half of the thick part is serrated in the ventral median line. — Calman (l. c.) mentions variation according to age in uropods and telson; on the uropods I can say nothing, but his remarks on the telson may possibly indicate that he, as suggested by Stebbing, did not separate it from *M. serricauda* Th. Scott.

Occurrence. **Not taken by the "Ingolf", but by the "Thor" at a single locality.**

South-West of the Færoes: Lat. 61°15' N., Long. 9°35' W., 463—515 fath.; 1 specimen (imm. ♀).

Distribution. Norman (1879) recorded it from Lat. 67°7' N., Long. 5°21' W., 500 fath., a station near the polar circle in the cold area, wherefore I suppose that there is a misprint in the latitude 67° instead of 60° N., and this would agree better with the other stations from the "Lightning"-Expedition. The same author recorded it from the sea in the triangle: the Færoes—Shetland—the Hebrides, 344 to 542 fath., and from a point far south-west of Ireland, 725 fath.; the "Thor" captured a specimen not far from the last-named place, 674—624 fath. (Stephensen). Calman records it from west of Ireland, 199 to 454 fath., in 1910 from three places in the southern part of the Bay of Biscay and from one place south-west of Lissabon, depths from 196 to 718 fath.; Sars' type was taken south-west of Lissabon at Lat. 38°10½' N., Long. 9°25' W., 750 fath.

59. **Makrocylindrus spiniventris** n. sp.

(Pl. IV, figs. 6 a—6 d).

Immature Female. Seen from the side the carapace, not including the considerably produced pseudorostrum, is a little oblong-ovate; seen from above it is rather oblong-oval. The ocular lobe without visual organs, in one specimen with a single large spine, in another (fig. 6 a) with a pair of similar large spines directed upwards and much forwards. Behind the ocular lobe the carapace has a transverse, sattle-shaped depression very conspicuous especially from the side (fig. 6 b); just behind the ocular lobe there is a smaller, and close behind this a large and thick, procurved spine. The upper margin of pseudorostrum is anteriorly curved much downwards, so that the end is rather obtuse, and a little behind this end a pair of dorsal, large, procurved spines, and close behind these two minute denticles, are found. Pseudorostrum has besides on the side below the ocular lobe two or three large and thick spines, and below the sattled-shaped depression and somewhat more backwards the lateral surface has a good number of somewhat small to minute denticles irregularly dispersed; behind the base of the antennæ the lower margin has 4 long and robust teeth, and behind them a few minute teeth. — The free thoracic segments smooth; third and fourth segments completely fused without any suture between them above and half downwards the sides (fig. 6 c). The abdominal segments increase in length from the second to the fifth, which is about as long as the sixth. First segment has below in the median line 3 very long, spiniform teeth rather near each other at their base but diverging strongly, and somewhat behind them a rather small tooth directed much backwards (in the figure indicated as seen through the leg); the same segment has, besides, between the upper surface and the side 2 or 3 spines, the posterior one strong. Second segment with a pair of robust sublateral denticles; the following segments show individual variation, as in one specimen they have no denticle, while in another specimen of the same size third and fourth segments have a similar pair of sublateral denticles, and fifth segment 3 pairs of sublateral denticles, the posterior pair robust.

Antennulæ (fig. 6 b) long; in the peduncle first joint has a long, spiniform process below at the end; second joint, which reaches beyond pseudorostrum, is a little less than twice as long as first joint and more than twice as long as the third; the upper flagellum scarcely as long as second peduncular joint, 4-jointed, with the 3 proximal joints subequal; lower flagellum somewhat longer than first joint of the upper, 3-jointed, but first and third joint very short. First pair of legs broken at the end of second joint, which is very robust with several strong teeth on the lower side. The three posterior pairs of legs have a single tooth or a couple of teeth on the proximal part of the anterior or posterior margin of second joint; merus of third and fourth pairs of legs somewhat elongated, but not fully half as long again as the three distal joints together, and these pairs each with a tiny rudiment of an exopod terminating in a seta; this rudiment is so small that on fig. 6 c it was necessary to render it proportionately too large. — Uropods (fig. 6 d) somewhat short and slender; the peduncle reaches about to the anal doors of the telson and has 5—7 spines on its inner margin; first joint of the endopod scarcely two-fifths as long as the peduncle, with 7 spines on the distal half of its margin; second joint somewhat short with 3 marginal spines (third joint mutilated in my specimens); the exopod slightly longer than the two proximal joints together of the endopod. Telson (fig. 6 d, and *t*) very long, a little longer than the two posterior abdominal segments combined, with slightly more than its proximal two-thirds cylindrical and no vestige of lateral teeth on this part, the distal part much narrowed towards the end which terminates in two short spines, while on the dorsal side of the telson before its end 3 pairs of sublateral spines are inserted, and the posterior pair of these spines longer than the terminal pair.

Length of two females without marsupium 7—7.1 mm.

Remarks. *M. spiniventris* agrees with *Diastylopsis* (?) *dubia* Bonnier in having third and fourth thoracic segments completely fused, in general outline, etc., but it differs in having the transverse sattle-shaped depression on the carapace, in the spines on the anterior part of carapace with pseudorostrum, in the relative length of the joints in the antennular peduncle and the armature of its first joint, in the upper antennular flagellum, in the extreme reduction of the exopods on third and fourth pairs of legs, in the armature of first abdominal segment, in having no lateral serration on the proximal part of telson, while its terminal part has 3 pairs of dorsal spines, finally in the number of spines on the endopod of the uropods. *M. spiniventris* agrees more with *Diastylis longipes* G. O. S. as figured and described by G. O. Sars and Bonnier, and in spite of several differences I should have considered my animals as younger specimens of the last named species, if both Sars and especially Bonnier had not most distinctly figured third and fourth thoracic segments as well separated respectively by a suture and an articulation across the dorsal side; it may, for the rest, be added that there is such differences between Sars' representation of the immature male and Bonnier's description and figures of the immature female of *D. longipes*, that it does not seem unthinkable that the two authors have examined animals of different species.

In the remarks on *Makrocylindrus* (p. 65) I have said why I refer the new form to this genus.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61° 15′ N., Long. 9° 35′ W., 463—515 fath.; 3 immature females.

Diastyloides G. O. Sars.

Of the two species hitherto known at least one and probably both live within the "Ingolf" area, but have not yet been found there, while a third, undescribed form has been gathered.

60. Diastyloides scabra n. sp.

(Pl. IV, fig. 7 a).

Adult Female. The single specimen is somewhat mutilated with a part of the carapace broken, but the species can easily be made recognizable. Carapace as to general outline, shape of pseudorostrum, and serration on a little more than half of the lower margin as in *D. biplicata* G. O. S., but it has no vestige of dorso-lateral keels or plicæ, and its surface is scabrous, covered with distinct sharp granules; almost the posterior half of the lower margin is not serrated but seen from below crenulated. Postero-lateral angles of last thoracic segment produced into an acute point. The two anterior abdominal segments each with a pair of sublateral denticles near the posterior margin. Abdomen slender; fifth segment long, nearly as long as second and third segments together, and twice as long as the sixth segment.

First pair of legs mutilated; second joint with most of the teeth on the inner margin less developed than in *D. serrata*. Second pair of legs with a couple of small teeth at the end of the inner margin of second joint, but without the long process found in *D. serrata* and *D. biplicata*; ischium with a small, slender tooth at the distal inner angle; carpus slender and about as long as the distal joints together. — Uropods (fig. 7 a) slender; peduncle a little longer than the two posterior abdominal segments combined, with about 8 spines on the inner margin; endopod somewhat shorter than the peduncle, its first joint somewhat less than twice as long as the two distal joints combined, with 7 spines on the inner margin; second joint conspicuously longer than the third, with 2 spines; third joint with the long terminal spine and a small spine near the end; the exopod reaches distinctly beyond the second joint of the endopod. Telson (fig. 7 a) as long as the exopod of the uropods; its thickened part is short, while more than its distal half is very slender, with 4 pairs of lateral spines rather distant from each other; the terminal spines lost in the specimen.

Length of the adult female 5.1 mm.

Remarks. *D. scabra* is instantly separated from *D. biplicata* in having no plicæ on the carapace; from *D. serrata* in having the distal part of the telson much longer and more slender, and by the proportionately shorter exopod of the uropods. — It may be remarked that I have not examined the mandibles of the single specimen, but the antennæ agree with those in *Diastyloides serrata*; besides telson, uropods, shape of carapace show close relationship to *D. biplicata*.

Occurrence. Not taken by the "Ingolf", but by the "Thor" at a single station.

South-West of the Færoes: Lat. 61°07′ N., Long. 9°30′ W., 443 fath.; 1 female with marsupium.

Brachydiastylis Stebbing.

This genus was established on a single species of *Diastylis* of somewhat aberrant aspect, *D. resima* Kr. Among the material to hand is the adult female of another species, which is allied to *B. resima*, but posses-ses in a still higher degree most of the peculiar features which separate the last-named form from the species of *Diastylis*. Consequently it may be justified to keep the two species in a separate genus which may be distinguished by the following diagnosis.

Pseudorostrum, which is long and somewhat or much upturned, has at least in the female several plumose setæ along the lower margin and anteriorly upwards on the sides and above behind the end. Antennulæ with the two proximal joints of the peduncle thick and short; third joint elongated, with a row of plumose setæ; upper flagellum 4-jointed, the lower 3-jointed. In the female third and fourth segments are immovably coalesced, and there is a considerable distance between the insertion of second and third pairs of legs. Second pair of legs in the female unusually short, not half as long as the first pair; in the male[1] second legs are anomal-ous, with second joint much expanded, carpus elongated and much longer than in the female, propodus armed with a long lateral process from the end. Third and fourth pairs of legs extremely robust and "adapted for digging", with several very thick setæ on the short and broad carpus; third legs with a long, spiniform

[1]) Only the male of *B. resima* is known, but most probably second legs are in the male of *B. nimia* n. sp. built as in the other species.

process on the anterior margin of second joint towards the end. Uropods with the exopod elongated, much or very much longer than the endopod, and terminating in an extremely long seta. — The other features as in *Diastylis*.

61. **Brachydiastylis resima** Kröyer.

1846. *Cuma resima* Kröyer, Naturh. Tidsskr. Ny Række, B. II, p. 165, 206, Tab. II, Fig. 2 a—b.
1849. — — Kröyer, in Gaimard, Voy. en Scand., Crust. Pl. III, fig. 1, a—p.
!1900. *Diastylopsis resima* G. O. Sars, Account, III, p. 65, Pl. XLVII.
1913. *Brachydiastylis resimus* Stebbing, Das Tierreich, 39. Lief. p. 107.

It may be remarked that Sars has not mentioned or figured the long, spiniform process on the anterior margin of second joint of third legs in the female; the process has the same size and shape as in *B. nimia* (shown in fig. 8 f on Pl. IV). Besides on Sars' figures the inner terminal seta on the exopod of the uropods is far too short; it is in reality longer than the exopod.

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

North-West Iceland: Dyre Fjord, 20 fath.; about 10 specimens.

According to Kröyer a couple of specimens were secured by Holbøll at "the southern Greenland", most probably Godthaab, Lat. 64°11' N. In 1900 Prof. Bergendal gathered 2 specimens at Jacobshavn, West Greenland at Lat. 69°13' N. A large number of specimens have been secured by Mag. W. Lundbeck at the north-west side of Iceland in Onundar Fjord, 11—12 fath.; at the east coast of Iceland it has been taken three times, viz. in Bakke Fjord, 12—15 fath., and Breiddals Vik, 6 fath., by Dr. A. C. Johansen, in Faskruds Fjord, 50—20 fath., by Mag. R. Hørring. At East Greenland it has been found in three localities, viz. by the Ryder Expedition in Hekla Havn, Lat. 70°27' N., and by the IInd Amdrup Expedition at Cape Dalton, ab. Lat. 69°30' N., 9—11 fath., and off Hurry Inlet, Lat. 70°50' N., 20 fath.

Distribution. Taken several times in the eastern part of Kattegat, 12 to 23 fath., and three times in Skager Rak off Skagen, 70 and 110 fath. (Meinert, H. J. Hansen, Bjorck). Found in several places at the coast of Norway to Varanger Fjord, generally in 6 to 20 fath. (G. O. Sars). Furthermore taken in Advent Bay, West Spitzbergen, at Lat. 78°16' N., 60 fath. (G. O. Sars), at the west coast of Novaya Zemlya near Lat. 73° N., 6—10 fath., in Matotschkin Schar, 4—6 fath., and in the Kara Sea, 10 fath. (Stuxberg). Taken off Fair Island, north-east of Scotland (Th. Scott). Ohlin records it from the east coast of Baffin Land, Lat. 72°38' N., 12—16 fath.; Calman had it from a station off Nova Scotia at Lat. 45°04' N., 57 fath.

62. **Brachydiastylis nimia** n. sp.

(Pl. IV, figs. 8 a—8 g).

Adult Female. Cephalothorax seen from above (fig. 8 a) rather oblong, not including pseudorostrum twice as long as broad, with the major part of each lateral margin from outside the ocular lobe to the posterior end of third segment very feebly convex, and the lateral margins diverge feebly from off the ocular lobe to near the end of third segment. Seen from the side (fig. 8 c) the carapace with pseudorostrum is a little more than twice as long as deep, and the upper margin of pseudorostrum occupies somewhat more than one-third of the length; it has above behind the ocular lobe a few denticles (fig. 8 b) and below these at the middle of each side two or three denticles; the antero-lateral corner below the base of the antennulæ is produced into a long, oblong-triangular, acute process; from this process the lower margin is serrated almost to the posterior end, and nearly the anterior half of the saw-teeth are somewhat long and strong, but from before the middle to near the posterior end of the margin they are gradually smaller. Pseudorostrum long, moderately upturned, with the upper margin slightly sinuate, the lower margin posteriorly a little concave; this lower margin has 4 or 5 rather long, plumose setæ, while 3 or 4 partly still longer setæ are situated close together on the side and above just behind the obtuse end. The free thoracic segments longer than carapace without pseudorostrum; a distinct suture is observed between third and fourth segments on the upper surface. Abdomen somewhat slender and of middle length; fifth segment slightly longer than the sixth.

Antennulæ (figs. 8 b and 8 c) long; the peduncle reaches beyond the end of pseudorostrum; upper flagellum nearly as long as third peduncular joint; lower flagellum as long as first joint of the upper. First pair of legs of moderate length as in *B. resima*; second joint (fig. 8 d) on the inner side with one very long, spiniform process, two teeth and some minute denticles; exopod with half of the outer margin of the long proximal joint serrated. Second pair of legs (fig. 8 e) proportionately very short; second joint with two good-sized processes and a few minute denticles on the inner margin; carpus only a little longer than the propodus, which is as long as the dactylus. Third pair (fig. 8 f) very robust; second joint with a long, strong, acute, a little curved, spiniform process on the anterior margin near the end; merus more than twice as long as the broad, short carpus, which has 7 very thick setæ on the convex posterior (upper) margin; propodus small with 1 similar seta. Fourth legs in the main as third pair, though somewhat shorter and still more robust, but without any process on second joint; fifth legs considerably smaller than the preceding pair, but rather similar in structure. — Uropods (figs. 8 a and 8 g) only a little shorter than the six abdominal segments together; peduncle slightly longer than the two posterior segments combined, without spines, but with a few hairs especially on the outer margin; exopod even somewhat longer than the peduncle, with the inner terminal seta thin and only a little shorter than exopod and peduncle together, while the outer terminal seta is considerably shorter; the exopod is about three and a half times a long as the endopod, which consequently looks nearly rudimentary, is 3-jointed, terminates in a rather long spine and has 2 spines on the inner margin. Telson about two-thirds as long as the peduncle of the uropods, with the part behind the anal valves conspicuously shorter than the proximal part; this narrow part terminates in two long, pubescent spines, but the lateral margins have no spines, only some 3 pairs of hairs, and the distal pair is somewhat long and robust towards the base.

Length of an ovigerous female 3.6 mm.

Remarks. *B. nimia*, though allied to *B. resima*, differs in the outline of the carapace and especially in shape and direction of pseudorostrum. Besides the uropods with their extremely long exopod and very short endopod are very interesting and afford an excellent character.

Occurrence. Not taken by the "Ingolf", but by the IInd Amdrup-Expedition in a single locality.

East Greenland: North of Stewart Land, ab. Lat. 70°30′ N., 158 fath. (29. VII, 1900); 2 ovigerous females.

Leptostylis G. O. Sars.

Of this characteristic genus 4 species have been gathered in the "Ingolf" area; 1 among them is new to science.

63. Leptostylis longimana G. O. Sars.

1865. *Diastylis longimana* G. O. Sars, Forh. Vid. Selsk. Christiania for 1864, p. 173.
!1900. *Leptostylis* — G. O. Sars, Account, III, p. 68, Pl. XLVIII.
1913. — *longimanus* Stebbing, Das Tierreich, 39. Lief. p. 127.

Sars says (in 1900) that the carapace is only clothed with scattered small hairs. I have found some individual difference as to the number of such hairs, which vary from being present in a moderately good number (from Stat. 27) to very few or perhaps nearly none. In the most hairy specimen the characteristic uropods are completely as in typical specimens from the North Sea. It may be remarked that in different genera of Cumacea (f. inst. *Eudorella* and *Diastylis*) a low or a somewhat higher number of hairs on carapace (or abdomen) does not as a rule afford a specific character; perhaps hairs are frequently broken at the base and lost.

Occurrence. Taken by the "Ingolf" at 7 stations.

Davis Strait: Stat. 27: Lat. 64°54′ N., Long. 55°10′ W., 393 fath., temp. 3.8°; 1 specimen.
Denmark Strait: Stat. 91: Lat. 64°44′ N., Long. 31°00′ W., 1236 fath., temp. 3.1°; 1 specimen.
East of Iceland: Stat. 105: Lat. 65°34′ N., Long. 7°31′ W., 762 fath., temp. ÷0.8°; 1 specimen.
— - — Stat. 102: Lat. 66°23′ N., Long. 10°26′ W., 750 fath., temp. ÷0.9°; 2 specimens.
— - — Stat. 103: Lat. 66°23′ N., Long. 8°52′ W., 579 fath., temp. ÷0.6°; 1 specimen.
North-West of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷0.6°; 1 specimen.
— — — Stat. 139: Lat. 63°36′ N., Long. 7°30′ W., 702 fath., temp. ÷0.6°; 4 specimens.

Distribution. Taken a single time in northern Kattegat, 30 fath., and several times in Skager Rak in depths from 70 to 350 fath. (Meinert, H. J. Hansen). At Norway taken at the south and west coast from near Christiania to Lofoten, "generally" in depths from 30 to 100 fath. (G. O. Sars). Calman records it from west of Ireland, 199 and 382 fath.; S. I. Smith wrote that "a single female, apparently of this species, was dredged in Casco Bay".

It may be remarked that the bathymetrical distribution of this species and its occurrence both in the warm and the cold deep-sea area is rather interesting, especially as it has also been taken both in Kattegat and at Norway in a depth of only 30 fathoms.

In a female with marsupium from the "Ingolf" Stat. 138 a probably new species of *Homoeoscelis* (a genus of parasitic Copepoda of the family Choniostomatidæ) is found in the branchial cavities.

64. **Leptostylis grandis** n. sp.

(Pl. IV, fig. 9 a).

Subadult Male. Carapace rather deep and long, more than twice as long as the dorsal side of the free thoracic segments, with a small number of hairs; seen from the side the outline of the cephalothorax is nearly as in the female *L. macrura* as figured by Sars, but seen from above it is narrower, more oblong-oval; pseudorostrum is moderately protruding, with the dorsal line horizontal, and the margin below the base is somewhat concave, thus constituting a feeble antennal notch and set with several quadrangular teeth; below and behind this notch the anterior half of the lower margin of the carapace is closely serrated with triangular teeth. Postero-lateral corner of fifth free segment angular, but not produced. Abdomen moderately slender and very long, a little less than half as long again as cephalothorax, as the latter is 3.5 mm. long, while the abdomen with telson is 5 mm. long; fifth segment very long, much longer than the fourth and fully twice as long as the sixth.

The antennular peduncles consist of three thick joints, but the terminal joint has not obtained the brush of sensory filaments; the flagella in this transition-stage afford scarcely any character. First pair of legs mutilated; second joint below on the distal part with a row of about 8 teeth. Second pair of legs with second joint as long as merus and carpus together; carpus consequently rather elongated, as long as dactylus plus half of the propodus. — Uropods (fig. 9 a) long; peduncle somewhat shorter than the two posterior abdominal segments together, somewhat less than twice as long as the endopod and twice as long as the exopod, with 15—16 spines on the inner margin; first joint of the endopod a little shorter than the two other joints together, with 3—4 spines on the inner margin; second joint slightly longer than the third, with a single spine; the exopod reaches the middle of third joint of the endopod. Telson nearly twice as long as broad; its terminal spines shorter than usual, only half as long as the breadth of telson; besides 2 pairs of lateral spines on the most distal part of telson.

Length of the subadult male 8.5 mm.

Remarks. *L. grandis* is considerably larger than any other species of this genus from the northern hemisphere. In general outline, length of abdomen, existence of teeth on the lower side of second joint of first legs and in relative length of the joints in second legs it is closely allied to *L. macrura* G. O. S., but it differs in the relative length of the joints in the endopod of the uropods and in the number of spines on the telson.

Occurrence. Taken by the "Ingolf" at a single very deep station in the warm area.

Davis Strait: Stat. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fath., temp. 1.5°; 1 subadult and 1 very young male.

65. **Leptostylis ampullacea** Lilljeb.

1856. *Cuma ampullacea* Lilljeborg, Öfv. K. Sv. Vet.-Akad. Förh. Tolfte Årg., f. 1855, p. 120.

!1900. *Leptostylis ampullacea* G. O. Sars, Account, III, p. 70, Pl. L, fig. 1.

1913. *Leptostylis ampullaceus* Stebbing, Das Tierreich, 39. Lief., p. 124.

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

North of Iceland: Stat. 127: Lat. 66°33′ N., Long. 20°05′ W., 44 fath., temp. 5.6°; 1 specimen.

Dr. A. C. Johansen has gathered this species in two places at the east coast of Iceland, viz. in Bakke Fjord, 25—32 fath., and 43—52 fath., and in Breiddals Vik, 6 fath. Dr. Th. Mortensen captured it at the Færoes 6 miles north-west of Kalsø, 60 fath.

Distribution. Taken several times in eastern Kattegat and the northern part of the Sound; rare in south-west Kattegat and the northern part of Store Belt; depths generally 14—16, but varying from 8 to 30—35 fath. (Meinert, H. J. Hansen). According to G. O. Sars found along the whole coast of Norway from Christiania Fjord to Vadsø, 30 to 100 fath.; Norman wrote that he captured it in Throndhjems Fjord, 250—300 fath., a depth which seems to be somewhat doubtful. Norman records it from off co. Durham, 40 fath.; finally it has been found in the Gulf of Maine, 52—90 fath. (S. I. Smith).

66. **Leptostylis villosa** G. O. Sars.

1869. *Leptostylis villosa* G. O. Sars, Nyt Mag. for Naturv. 16. B., p. 344.
!1900. — — G. O. Sars, Account, III, p. 71, Pl. L, fig. 2.
1913. — *villosus* Stebbing, Das Tierreich, 39. Lief. p. 125.

Probably *L. gracilis* Stapp. and *L. borealis* Stapp., established respectively on adult males and on immature females captured partly in the same localities at the south coast of Novaya Zemlya, are synonyms to *L. villosa* G. O. S. — Stappers established both species in 1908, and his full account is found in Camp. arct. Duc d'Orléans, Crust. Malac., 1911, p. 116 and 120, Pls. V—VI, figs. 1—10, Pl. VII. Unfortunately Stappers does not mention any serration on the lower margin of the carapace, and his figures show no trace of saw-teeth, which certainly is erroneous, and in the present case it is especially unfortunate, because *L. villosa*, as pointed out and figured by Sars, is distinguished in having nearly the whole lower margin of the carapace adorned with very peculiarly formed, lamellar teeth. According to my own observation *L. villosa* shows some individual variation in the relative length of the exopod of the uropods, which sometimes is not much longer than the two proximal joints together of the endopod, sometimes reaches the middle of third joint. Stappers' figures of the uropods in his two species agree rather well with these appendages in *L. villosa*. Sars says that the two anterior free thoracic segments exhibit a structure as in *L. ampullacea*, viz. "each having the anterior edge emarginated in the middle, and forming on each side of the emargination a slight appressed lappet." This peculiar structure is well developed in adult females of *L. villosa* (as figured by Sars), but in females with the marsupium half developed the lappets are very feebly developed, and in females without marsupium and in males lappets are indistinct or wanting — consequently the absence of lappets in Stappers' specimens does not afford a specific character.

Occurrence. Taken by the "Ingolf" at 4 stations.

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9°; 1 specimen.

North of Iceland: Stat. 128: Lat. 66°50′ N., Long. 20°02′ W., 194 fath., temp. 0.6°; 4 specimens.

— - — Stat. 126: Lat. 67°19′ N., Long. 15°52′ W., 293 fath., temp. ÷ 0.5°; 1 specimen.

North-West of the Færoes: Stat. 138: Lat. 63°26′ N., Long. 7°56′ W., 471 fath., temp. ÷ 0.6°; 2 specimens.

The "Thor" captured this species at 3 stations.

South-West of Iceland: Lat. 63°46′ N., Long. 22°56′ W., 80 fath.; hundreds of specimens.

— - — Lat. 63°15′ N., Long. 22°23′ W., 114—172 fath.; 1 specimen.

South of Iceland: Lat. 63°42′ N., Long. 17°34′ W., 18—40 fath.; 1 specimen.

Mag. W. Lundbeck has secured specimens at the north-west side of Iceland in Ønundar Fjord, 11—12 fath; Dr. A. C. Johansen gathered it in two places at Iceland, viz. at the south-east coast in Loons Vik, 40 fath., and near the south coast at Vestman Islands, 68—70 fath.

Distribution. Found in the eastern part of Kattegat and the northern part of the Sound, 12 to 30 fath. (Meinert, H. J. Hansen, W. Bjørck); the "Thor" captured it two times in Skager Rak, 100 and 133 fath. At Norway captured in several places from Christiania Fjord to Vadsø "in depths below 60 fathoms" (G. O. Sars). The "Thor" gathered it in the middle western part of the North Sea at Lat. 56°33′ N., Long. 1°47′ E., 45 fath., and Th. Scott records it from the western side of Scotland in the Firth of Clyde.

VII. The Order *Nebaliacea*.

Of this very small but extremely interesting order a single species has been known from Greenland since 1780. The "Ingolf" captured another species described from Norway. More than these 2 species cannot be expected to live in our area.

The four main-papers both on genera and species and on morphological structure, etc. have been published by Claus in 1888, by G. O. Sars in 1887 and 1896, and by Joh. Thiele in 1904. A paper by Joh. Thiele: "Beobachtungen über die Phylogenie der Crustaceenbeine" (1905), may be named, because it deals at some length with the appendages in Nebaliacea, but its ideas have never been and will scarcely ever be accepted by Zoologists with real knowledge of Crustacea. — In 1904 W. T. Calman published a valuable paper on the classification of the Malacostraca, and in his excellent hand-book (1909) the Zoologist will find a good view on the organization and position in the system of the series Leptostraca with the single recent order, the Nebaliacea.

In the present paper the morphological structure of the appendages in this order is treated, as I cannot accept the statements published by Claus, Sars or Thiele; the general outline of an appendage and the old idea that in Crustacea the sympod (or protopod) of legs etc. typically consists of two joints, or besides some superficial observations on musculature, have been the basis of their interpretations. It may be added that the investigation is a section of earlier studies on the morphology of the appendages, etc., of Arthropoda to be completed and published in a not too remote future.

The idea, on which the study is based, is that one ought to examine the chitinized pieces in appendages of Crustacea (or Arthropoda) — quite as a Zoologist examines the ossified parts in legs of Vertebrates, or the movable and immovable bones in heads of Pisces and Reptiles for comparison with the elements in birds or mammals. And as to the mouth-parts my point of departure is that their lobes are processes on the inner side from the joints, consequently a chitinized piece on the free posterior or lower side of each lobe in maxillulæ, maxillæ, maxillipeds, must be connected with the chitinized outer part of the joint, to which each lobe belongs.

Some further points may be mentioned. The musculature in legs may sometimes be of importance for the study of homology of joints, but the disappearance of musculature from a joint cannot as a rule be used in morphological interpretation, because muscles are not found when a joint shall not be moved; by fusion of two joints in an appendage the movement between them ceases, and when a joint is much reduced, its chitinized part proportionately small, muscles to its movement are frequently not found. From detailed study of the musculature in the head of various families of Diptera I have learnt, that a moderately well developed morphological element is in one family completely without musculature, while in other families it has an active, not only a passive function, is consequently larger and equipped with muscles. The chitinized tubes or plates of an appendage are the most important elements in morphological investigation; the musculature is secondary.

As the order Nebaliacea generally and with good reason is considered as the lowest type among the Malacostraca, one may expect that the appendages show some primitive features rather well preserved. Consequently my old "theory", that in the antennæ, mouth-parts and legs of Crustacea the sympod consists originally of three joints, should find some support in this order, and we shall see how far it can be realized. But before entering the topic a few remarks on the performance of such investigation may be made. In order to study the chitinized elements of appendages, especially of mouth-parts of Crustacea (or Arthropoda), it is frequently necessary to have the musculature partly or totally removed. It can be made in different ways, but it is sometimes necessary to put the object in a convenient solution of caustic potash, then to remove the dissolved contents by cautious handling in water or glycerine, examine the animal or the appendage first under the simple microscope, because it is then possible by the aid of two knifes as broad as a well-sized needle to discover the limits between the membranous parts and the more firmly chitinized elements; when laid under the compound microscope the cover-glass must be hindered by a minute wooden wedge from pressing the appendage.

The order Nebaliacea comprises 4 valid genera; but of *Nebaliella* Thiele and *Nebaliopsis* G. O. S. I have only a single young specimen of each genus, and the following study is in the main made on *Nebalia bipes* from Greenland. As *Nebaliella* exhibits two primitive features in the antennæ, Thiele's representation and an observation of my own are referred to.

The *Antennulæ* (fig. 10 a) are described by Sars and Thiele as having the peduncle 4-jointed, which is correct, but what they name first joint consists of two different parts. The large proximal part of this so-called joint must be interpreted as a protuding portion of the head (*h*); it is on the outer side marked off from the skeleton behind it by a fine curved line, which neither in *Nebalia* nor in *Nebaliella* shows the slightest degree of movability, when one attempts to move it by two minute knifes; furthermore the right protruding portion is united on the lower side with the left portion without any suture, and the whole undivided lower wall is well chitinized; at the distal end of this solid part is seen a narrow transverse band (*1*), which is firmly chitinized and very movable, in reality the first joint of the antennula. The 3 following joints of the peduncle are well known.

The *Antennæ* (fig. 10 a) are described by authors as having the peduncle 3-jointed in *Nebalia* and *Paranebalia*, 4-jointed in the two other genera; it has been seen by Sars and Thiele that in *Nebalia* the third joint in reality consists of two joints completely fused, and that these two joints are well separated in *Nebaliella* and *Nebaliopsis*. It is now generally admitted that the Nebaliacea are more related to the Mysidacea than to any other order; furthermore it is known that in Mysidacea and Isopoda Asellota the sympod of the antennæ consists of 3 joints, and that the exopod is more or less developed, furthermore that beyond the sympod the 3 proximal joints of the endopod are very different in aspect from the flagellum, so that in the Asellota with the exopod or squama much reduced the peduncle of the antennæ consists of 6 distinct joints. We shall now see that the same parts are found in *Nebalia*. What the authors considered to be the first joint consists of two well separated joints (fig. 10 a, *1* and *2*), the first being in *Nebalia* well chitinized on most of its outer side and separated from the second by a narrow membrane. Near the end of the lower margin of third joint in *Nebalia* is on the outer side an insignificant, low elevation, but in *Nebaliella antarctica* is found, as figured by Thiele (1904), an oblong protuberance, which in my young specimen is well marked off and certainly is the reduced squama; in several Asellota the squama is also quite small and of similar shape. At the end of third joint the fourth is represented by a transverse, movable, well chitinized plate (fig. 10 *a*, *4*); also in Mysidacea and Asellota this joint is short. Fifth and sixth joints are, as already said, fused in *Nebalia*, well separated in *Nebaliella* and *Nebaliopsis*.

The *Maxillulæ* (fig. 10 b) are rather easy to investigate. Each consists of a proximal broad part, the sympod, and an extremely long "palp", the endopod. The sympod consists of 3 joints; first (*1*) and third (*3*) joints each with a lobe on the inner side, while second joint (*2*) has none, completely as in Mysidacea, Isopoda, etc. The chitinized elements of joints and lobes are seen in fig. 10 b; the membranous skin between them has a greyish shading. An exopod is wanting in this order.

The *Maxillæ* (fig. 10 c) consist of a sympod with a 2-jointed endopod and an unjointed exopod. The sympod consists in other orders of Malacostraca of 3 most frequently well separated joints, with a lobe, frequently bifid, from second and from third joint, but never any lobe from first joint. In *Nebalia* the plate of first joint (*1*) is united with that of second joint, as there is no distinct line between them; the lobe from second joint (l^2) has its chitine bipartite, while the lobe from third joint (l^3) is only bifid.

The thoracic Legs (fig. 10 d). Only sympod and endopod need to be mentioned. The sympod consists according to authors of 2 joints, but it is in reality 3-jointed. The first joint can be seen by a strong pocket-lens in a *Nebalia*, when the carapace is taken away and the epipods pushed aside; the joint is short, but its outer side is well chitinized and well marked off both from the following joint with the epipod and from the tergite of the segment; seen from behind this joint (fig. 10 d, *1*) is a transverse triangle. Second joint (*2*) has a kind of low lobe on the inner side, and this lobe is always distinctly cleft rather little behind the distal end. As to third joint (*3*) it is difficult to decide where it terminates and the endopod begins. In *Nebalia* one can as a rule count 5 joints in the endopod, the two or three most distal marked off by a line across the leg, while between the more proximal joints this line is distinct only towards the inner margin. But in a couple of cases I counted with certainty 6 joints (fig. 10 d); the sympod was then considerably shorter, as an additional, more proximal transverse line is visible near the inner margin and situated opposite the insertion of the exopod. — In the penultimate legs of *Paranebalia* I found features very valuable for the understanding. Near the inner margin of the narrow endopod of the leg five very small, narrow and quite short musles are distributed with long intervals, these musles are longitudinal though somewhat oblique, each of the more distal muscles is crossed at its distal end by a distinct line on the leg indicating an articulation, while the line is indistinct across the second and could not be seen across the proximal muscle, which is situated a little beyond the base of the exopod, though near the opposite margin of the limb. As five muscles are distinct, we have consequently 5 movable joints in the endopod. But the last joint is very long, and its short terminal part is marked off by a moderately distinct very obliquely transverse line also seen and figured by Thiele, and partly indicated by Sars in his figure of the last thoracic leg. When this terminal piece is considered to be a joint we have 6 joints in the endopod, thus the same number as seems sometimes to exist in *Nebalia*. Consequently in all 9 joints in a thoracic leg. In all other orders of Malocastraca first joint, praecoxa, has disappeared, is in the Decapoda most probably a part of the pleuron bearing the pleurobranchiæ; in Mysidacea the leg has 7 joints plus a terminal claw, and this claw is probably a modified joint, viz. the short terminal joint observed in *Paranebalia*, while in *Nebalia* it is considerably longer.

The natatory Legs (fig. 10 e), four pairs, have according to authors a 2-jointed sympod. But on the exoskeleton of a *Nebalia* cleaned in caustic potash it is not difficult to see, that between the tergite and the long distal joint of the sympod small chitinized plates are found, and these are very naturally interpreted as belonging to two joints. Fig. 10 e shows the tergite (*t*), the plates (*1* and *2*) and the proximal part of the long joint (*3*) of third leg from the outer side in natural position; the lettering may be sufficient for the understanding. This structure is similar to that found in abdominal legs of *Cirolana*, *Æga* and *Arcturus* as described and figured in my work on the "Ingolf" Isopoda.

Nebalia Leach.

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

1. Nebalia bipes O. Fabr.

(Pl. IV, figs. 10 a—10 e).

1780. *Cancer bipes* O. Fabricius, Fauna Groenlandica, p. 246, fig. 2.
1847. *Nebalia bipes* Kröyer, Naturh. Tidsskr. Ny Række, Bd. II, p. 436.
1849. — — Kröyer, in Gaimard, Voy. en Scand. Pl. XL, fig. 2.
!1896. — — G. O. Sars, Fauna Norvegiæ, Bd. I, p. 9, Tab. I, Fig. 1—3, Tab. II—III, Tab. IV, Fig. 1—8; Tab. V.
1904. — — Thiele, Die Leptostraken, in Wiss. Ergebn. Deut. Tiefsee-Exped. Bd. VIII.

Occurrence. Not taken by the "Ingolf", but gathered by many collectors.

It has been secured at many places along the coast of West Greenland. It is recorded from Saunders Isl., ab. Lat. 76½° N., 5—10 fath. (Ortmann); Cape Dudley Digges, Lat. 76°09′ N., 17—25 fath. (Ohlin), Lille Karajak Fjord, Lat. 70½° N. (Vanhoffen), Søndre Strømfjord, ab. Lat. 67⅔° N., 5 to 30 fath. (Stephensen), Lat. 66°59′ N., Long. 55°27′ W., 57 fath. (Norman); Kvanefjord, ab. Lat. 61°55′ N., Bredefjord, Skovfjord, Julianehaab (Lat. 60°43′ N.), in depths from 3 to 5—8 fath. (Stephensen). The Museum possesses specimens secured by seven collectors from the following hitherto unrecorded places in West Greenland: Nusak (Lat. 70°25′ N., 10 fath.), Egedesminde, Holstensborg, Ikertok Fjord, 30 fath., Godthaab, 2—5, 3, 5 and 10—15 fath., and places near Frederikshaab, 5 to 15 fath.

At Iceland it has been taken on the north-west side in Isefjord, 4 fath., by "Diana"; on the east side in Bakke Fjord, 52—43 and 12—15 fath., by Dr. A. C. Johansen, and in Faskruds Fjord, 20—50 fath., by Mag. R. Hørring, finally on the south-west side at Reykjavik, 6 fath., "Diana". — At the Færøes it has been gathered in Klaksvig, 10—15 fath., by Dr. Th. Mortensen.

At East Greenland this form has been taken at nine places recorded by Buchholz, Ohlin and K. Stephensen, and the last-named author has put them together in his Conspectus (1913). The places are situated between Lat. 76°45′ N. and 73°6′ N., the depths generally from $1^1/_2$ to ab. 10 fath., excepting a single statement by Buchholz: 150 fath., which most probably is erroneous. Finally Mag. Kruuse secured a specimen at a more southern locality in East Greenland, viz. Tasiusak, Lat. 65°37′ N.

Distribution. The Copenhagen Museum possesses specimens from two places in Kattegat and from Hornbæk, in the northern end of the Sound. Not rare along the coast of Norway, from Christiania Fjord to Vadsø, generally in 10 to 30 fath. (G. O. Sars). Recorded from West Spitzbergen at Lat. 79°43′ N., 13—15 fath. (Ohlin); from various places at the British Isles, f. inst. at Northumberland and Durham, and at the south coast of Devon and Cornwall (Norman); from places at the east coast of Baffin Land northwards to Lat. 71°57′ N., 5—20 fath. (Ohlin); finally from Unalaska, 8—12 fath. (Thiele).

So far it is possible to walk with tolerable certainty. But according to the literature *N. bipes* shall have a much wider distribution. Specimens of *Nebalia* with the eyes well developed have been found at various places in the Mediterranean, at the French coast and at Madeira (*N. Geoffroyi* H. Milne-Edw.); at Cuba; in the Red Sea; at Ceylon; at Japan (*N. japanensis* Claus); at the Pribyloff Islands; at Chile (*N. chilensis* Claus); in the Strait of Magellan; finally at New Zealand (*N. longicornis* Thoms.). In 1904 Thiele (op. cit.) referred all these "forms" to a northern species, *N. bipes* O. Fabr., and a southern species, *N. longicornis* G. M. Thomson, and speaks of "subspecies". One gets the impression that our present knowledge is quite insufficient, that a monograph of *Nebalia* based on rich material from most seas must be worked out by an able Zoologist, who after a critical study of the animals and the specific characters points out the limitation of the species, and consequently their distribution.

2. **Nebalia typhlops** G. O. Sars.

1870. *Nebalia typhlops* G. O. Sars, Forh. Vid. Selsk. Christiania for 1869, p. 169.

1896. — — G. O. Sars, Fauna Norvegiæ, Bd. I, p. 31; Tab. I, Fig. 4; Tab. IV, Fig. 9—19.

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

Davis Strait: Stat. 32: Lat. 66°35′ N., Long. 56°38′ W., 318 fath., temp. 3.9; many specimens.

Distribution. At the west coast of Norway taken off Stavanger, in Throndhjems Fjord and at Lofoten, 150—200 fath. (G. O. Sars). Recorded from west of Ireland, 120 and 199 fath. (Tattersall) and from the Mediterranean (G. Haller and Lo Bianco, test. Joh. Thiele).

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. *Leucon spinulosus* n. sp.

Fig. 1 a. Cephalothorax of a female with marsupium from the "Ingolf" Stat. 24, from the left side; × 30 Major part of the siphon omitted.

— 1 b. Anterior part of carapace of an ovigerous female from the "Ingolf" Stat. 36, from the left side; × 50.

— 1 c. Left second leg of an ovigerous female from the "Ingolf" Stat. 36, from below; × 41. Major part of second joint omitted.

— 1 d. Left uropod of an immature female from the "Ingolf" Stat. 24, from above; × 76.

Fig. 2. *Leucon tener* n. sp.

Fig. 2 a. Carapace of an ovigerous female, from the left side; × 45.

— 2 b. Distal part of left first leg of an immature female from the "Ingolf" Stat 97, from below; × 52

— 2 c. Left uropod of an ovigerous female, from above; × 52.

Fig. 3. *Leucon spiniventris* n. sp.

Fig. 3 a. Immature female, from the side; × 13. Distal half of abdomen omitted.

— 3 b. Anterior part of carapace with left antennula of the same female, from the side; × 25.

— 3 c. Three posterior thoracic segments and first abdominal segment of the same female in order to show the ventral and marginal processes, from the side; × 19.

— 3 d. Left uropod of a female with marsupium, from above; × 37.

Fig. 4. *Leucon profundus* n. sp.

Fig. 4 a. Cephalothorax of a female with marsupium from the "Ingolf" Stat. 24, from the side; $\times \frac{36}{2}$.

— 4 b. Anterior part of carapace with left antennula of the same female; × 36.

— 4 c. Left first leg of a female with the marsupium half developed, from below; × 32. Exopod omitted.

— 4 d. Left uropod of a female from the "Ingolf" Stat. 36, from above; × 31.

Fig. 5. *Leucon Nathorstii* Ohlin.

Fig. 5 a. Left first leg of a female with marsupium from Jan Mayen, from below; × 40.

— 5 b. Left uropod of an adult female from Jan Mayen, from above; × 44.

Fig. 6. *Leucon serratus* Norman.

Fig. 6 a. Carapace with left antennula of an ovigerous female, from the side; × 33.
— 6 b. Left antennula of the same female, from the side; × 81.
— 6 c. Left third maxilliped of an ovigerous female, from below; × 50.
— 6 d. Distal part of left first leg of an ovigerous female, from below; × 40.
— 6 e. Right uropod of an ovigerous female, from above; × 39.

Fig. 7. *Leucon robustus* n. sp.

Fig. 7 a. Cephalothorax with left antennula of a female with the marsupium half developed, from the side; × 19.
— 7 b. Anterior part of carapace with left antennula of the same specimen; × 39.
— 7 c. Left first leg of an immature female, from below; × 39.
— 7 d. Left uropod of the largest immature female, from above; × 35.

Fig. 8. *Eudorella hispida* G. O. Sars.

Fig. 8 a. Front part of carapace with left antennula of an adult female, from the side; × 33.
— 8 b. Front end of carapace of an immature female; × 49.
— 8 c. Left uropod of an adult female from the "Ingolf" Stat. 32, from above; × 33.

Fig. 9. *Eudorella arctica* n. sp.

Fig. 9 a. Front end of carapace of an immature female, from the side; × 80.
— 9 b. Distal part of left first leg of an immature female, from below; × 27.
— 9 c. Distal part of left second leg of an ovigerous female, from below; × 35.
— 9 d. Right uropod of an ovigerous female, from above; × 40.

Fig. 10. *Eudorella parvula* n. sp.

Fig. 10 a. Left uropod of an ovigerous female from the "Ingolf" Stat. 25, from above; × 59.

Plate II.

Fig. 1. *Eudorella parvula* n. sp. (continued).

Fig. 1 a. Front part of carapace with left antennula of an adult female from the "Ingolf" Stat. 25, from the side; × 50.
— 1 b. Front end of carapace of a female without marsupium from the same station; × 80.
— 1 c. Front end of carapace of a female with marsupium from the same station; × 80.
— 1 d. Distal part of first left leg of an ovigerous female from the same station, from below; × 42.
— 1 e. Distal part of left second leg of the last-named female, from below; × 55.
— 1 f. Front end of carapace of an immature male from the same station; × 90.

Fig. 2. *Eudorella intermedia* n. sp.

Fig. 2 a. Front part of carapace of an immature female, from the side; × 53.
— 2 b. Major part of first left leg of the same female, from below; × 29.
— 2 c. Major part of left second leg of another immature female, from below; × 29.
— 2 d. Left uropod of an immature female, from above; × 36.

Fig. 3. *Eudorella æquiremis* n. sp.

Fig. 3 a. Front part of carapace with left antennula of an adult female, from the side; × 44.
— 3 b. Major part of left first leg of an adult female, from below; × 33.
— 3 c. Major part of left second leg of an adult female, from below; × 44.
— 3 d. Left uropod of a subadult female, from above; × 45.

Fig. 4. *Cumella tarda* n. sp.

Fig. 4 a. Anterior part of carapace with eyes and the proximal portion of the branchial siphon of an adult male, from the side; × 54.
— 4 b. Eyes and pseudorostrum of an adult male, from above; × 54.
— 4 c. Left antennula of an adult male, from the outer side; × 48.
— 4 d. Left second maxilliped of an adult male, from below; × 43.
— 4 e. Left third maxilliped of an adult male, from below; × 43. Setæ on exopod omitted.
— 4 f. Left first leg, mutilated, of an adult male, from below; × 43.
— 4 g. Last abdominal segment with right uropod of an adult male, from above; × 41.

Fig. 5. *Cumella egregia* n. sp.

Fig. 5 a. Adult male, from the side; × 16.
— 5 b. Front part of carapace with left antennulæ and the proximal part of the branchial siphon of the same male; × 32. *o*. ocular lobe, the distal half of which is lost in the adult specimen, but has been added on the figure from the well preserved lobe in the small specimen.
— 5 c. Fourth and proximal part of fifth abdominal segment of the same adult male, from the side; × 50.
— 5 d. Posterior part of abdomen with left uropod of the same male, from above; × 33.

Fig. 6. *Cumellopsis Helgæ* Calman.

Fig. 6 a. Left third maxilliped of a female with marsupium, from below; × 29.
— 6 b. Left first leg of the same female, from below; × 29. Setæ on exopod omitted.
— 6 c. Left second leg of the same female, from below; × 29. Setæ on exopod omitted.
— 6 d. Last abdominal segment with left uropod of an adult female, from above; × 29.

Fig. 7. *Procampylaspis bituberculata* n. sp.

Fig. 7 a. Cephalothorax of a subadult female, from the side; × $^{25}/_{2}$.
— 7 b. Cephalothorax of the same female, from above; × 11.
— 7 c. Left second maxilliped of the same female, from below; × 23.
— 7 d. Distal part of second maxilliped, from below; × 66.
— 7 e. Left third maxilliped of the same female, from below; × 23. *t.* tube (see the text).
— 7 f. Left first leg of the female, from below; × 23. Setæ on exopod omitted.
— 7 g. Left second leg of the female, from below; × 23.
— 7 h. Carpus and propodus of the leg exhibited in fig. 7 g, from below; × 41.
— 7 i. Last abdominal segment with right uropod of the female, from above; × 21.
— 7 k. Cephalothorax of the adult male, from the side; × $^{25}/_{2}$.
— 7 l. Cephalothorax of the same male, from above; × 11.
— 7 m. Last abdominal segment with right uropod of the male, from above; × 21.

Fig. 8. *Procampylaspis macronyx* n. sp.

Fig. 8 a. Anterior part of cephalothorax of an adult male, from the side; × 14.
— 8 b. Major part of left second maxilliped of the same male, from below; × 24.
— 8 c. Distal joints of second maxilliped exhibited in fig. 8 b, from below; × 45.
— 8 d. Left third maxilliped of the same male from below; × 24. *t.* tube.
— 8 e. Left first leg of the same male, from below; × 24.
— 8 f. Major part of left second leg of the same male, from below; × 24.
— 8 g. Sixth abdominal segment with left uropod of the same male, from above; × 24.

Plate III.

Fig. 1. *Campylaspis rubicunda* Lilljeb.

Fig. 1 a. Distal joints of left second maxilliped of a female from Lat. 63°46′ N., from below; × 91.

Fig. 2. *Campylaspis alba* n. sp.

Fig. 2 a. Cephalothorax of an adult female, from above; × 12.
— 2 b. Anterior part of the carapace of the same female, from above; × 24.
— 2 c. Cephalothorax of an adult female, from the side; × 12.
— 2 d. Left second maxilliped of an adult female, from below; × 31.
— 2 e. Distal joints of the same maxilliped, from below; × 77.
— 2 f. Left third maxilliped of an adult female, from below; × 32.
— 2 g. Left first thoracic leg of the same female, from below; × 32.
— 2 h. Left second thoracic leg of the same female, from below; × 32.
— 2 i. Posterior end of abdomen with left uropod of an adult female, from above; × 32.

Fig. 2 k. Anterior part of carapace of an adult male, from above; × 24.
— 2 l. Posterior part of abdomen with left uropod of an adult male, from above; × 23.

Fig. 3. *Campylaspis laticarpa* n. sp.

Fig. 3 a. Cephalothorax of an adult female, from above; × 8.
— 3 b. Anterior part of carapace of the same female, from above; × 19.
— 3 c. Cephalothorax of an adult female, from the side; × 8.
— 3 d. Left second maxilliped of an adult female, from below; × 32.
— 3 e. Distal joints of the same maxilliped, from below; × 80.
— 3 f. Left third maxilliped of an adult female, from below; × 22.
— 3 g. Left first thoracic leg of the same female, from below; × 22.
— 3 h. Left second thoracic leg of the same female, from below; × 22.
— 3 i. Posterior part of abdomen with left uropod of an adult female, from above; × 22.
— 3 k. Cephalothorax of an adult male, from above; × $^{15}/_{2}$.
— 3 l. Posterior part of abdomen with left uropod of an adult male, from above; × 22.

Fig. 4. *Campylaspis undata* G. O. Sars.

Fig. 4 a. End of second joint, ischium, merus and carpus of left third maxilliped of a female, from below; × 49.

Fig. 5. *Campylaspis rostrata* Calman.

Fig. 5 a. Left second maxilliped of a subadult female, from below; × 30.
— 5 b. Distal joints of the same maxilliped, from below; × 69.
— 5 c. Left third maxilliped of a subadult female, from below; × 30.

Fig. 6. *Campylaspis intermedia* n. sp.

Fig. 6 a. Cephalothorax of a subadult female, from above; × 12.
— 6 b. Cephalothorax of the same female, from the side; × 12.
— 6 c. Left second maxilliped of a subadult female, from below; × 28.
— 6 d. Distal joints of the same maxilliped, from below; × 82.
— 6 e. Left third maxilliped of the same female, from below; × 28.
— 6 f. End of second joint, ischium, merus and carpus of the same maxilliped, from below; × 60.
— 6 g. Left first leg of the same female, from below; × 28.
— 6 h. Left second leg of the same female, from below; × 28.
— 6 i. End of abdomen with right uropod of a subadult female, from above; × 28.

Fig. 7. *Campylaspis horrida* G. O. Sars.

Fig. 7 a. Merus of left third maxilliped of a female, from below; × 73. Setæ omitted.

Fig. 8. *Campylaspis verrucosa* G. O. Sars.

Fig. 8 a. Distal half of left third maxilliped of a female, from below; × 53. Setæ omitted, excepting the basal part of the three thickest setæ.

Fig. 9. *Campylaspis globosa* n. sp.

Fig. 9 a. Left second maxilliped of the adult female, from below; × 25.
— 9 b. Distal joints of the same maxilliped, from below; × 70.
— 9 c. Left third maxilliped of the adult female, from below; × 25.
— 9 d. End of second joint and the three following joints of third maxilliped, from below; × 47.
— 9 e. Left first leg of the same female, from below; × 25.
— 9 f. Left second joint of the same female, from below; × 25.
— 9 g. End of abdomen with left uropod of the same female, from above; × 29.

Plate IV.

Fig. 1. *Campylaspis globosa* n. sp. (continued).

Fig. 1 a. Cephalothorax of an adult female, from above; × 11.
— 1 b. Cephalothorax of the same female, from the side; × 10.

Fig. 2. *Campylaspis serratipes* n. sp.

Fig. 2 a. Cephalothorax of a subadult female, from above; × 19.
— 2 b. Cephalothorax of a subadult female, from the side; × 19.
— 2 c. Left second maxilliped of a subadult female, from below; × 41.
— 2 d. Distal joints of the same maxilliped, from below; × 88.
— 2 e. Left third maxilliped of the last-named female, from below; × 41.
— 2 f. Left first thoracic leg of the same female, from below; × 41.
— 2 g. Left second thoracic leg of the same female, from below; × 41.
— 2 h. Right uropod of a subadult female, from above; × 41.

Fig. 3. *Platysympus tricarinatus* n. sp.

Fig. 3 a. Carapace and first thoracic segment of an immature female, from above; × 12.
— 3 b. Posterior part of abdomen with left uropod of an immature male, from above; × 32.
— 3 c. Distal part of telson of the last-named male, from above; × 84.

Fig. 4. *Diastylis hastata* n. sp.

Fig. 4 a. Cephalothorax and the three anterior abdominal segments of an adult female from the "Ingolf" Stat. 24, from the side; × 19.

Fig. 4 b. Left first thoracic leg of a subadult female from the same station, from below; × 34.
— 4 c. Left second thoracic leg of the last-named specimen, from below; × 34.
— 4 d. Left fourth thoracic leg of an adult female, from the outer side; × 34.
— 4 e. Posterior part of abdomen with left uropod of a female without marsupium (5 mm long), from above; × 26.

Fig. 5. *Diastylis longicaudata* Bonnier.

Fig. 5 a. Posterior part of abdomen with peduncle of right uropod of a subadult female, from above; × 23.

Fig. 6. *Makrocylindrus spiniventris* n. sp.

Fig. 6 a. Anterior part of carapace of an immature female, from above; × 25.
— 6 b. Anterior part of carapace with left antennula and antenna of another immature female, from the side; × 25.
— 6 c. Three posterior thoracic and two anterior abdominal segments of the last-named specimen, from the side; × 25.
— 6 d. Posterior part of abdomen with right uropod of an immature female, from above; × 25. *t*. Distal part of telson more highly magnified, showing the dorsal spines.

Fig. 7. *Diastyloides scabra* n. sp.

Fig. 7 a. Posterior part of abdomen with right uropod of an adult female, from above; × 23.

Fig. 8. *Brachydiastylis nimia* n. sp.

Fig. 8 a. Adult female, from above; × $^{31}/_{2}$.
— 8 b. Anterior part of carapace of the same female, from above; × 31.
— 8 c. Cephalothorax of another adult female, from the side; × 26.
— 8 d. Left first thoracic leg of an adult female, from below; × 45.
— 8 e. Left second thoracic leg of the same female, from below; × 45.
— 8 f. Left third thoracic leg of the same female, from the outer side; × 45.
— 8 g. Posterior part of abdomen with right uropod of the female shown in fig. 8 a, from above; × 31. Major part of the two terminal setæ on the exopod omitted.

Fig. 9. *Leptostylis grandis* n. sp.

Fig. 9 a. Posterior part of abdomen with left uropod of a subadult male, from above; × 22.

Fig. 10. *Nebalia bipes* O. Fabr.

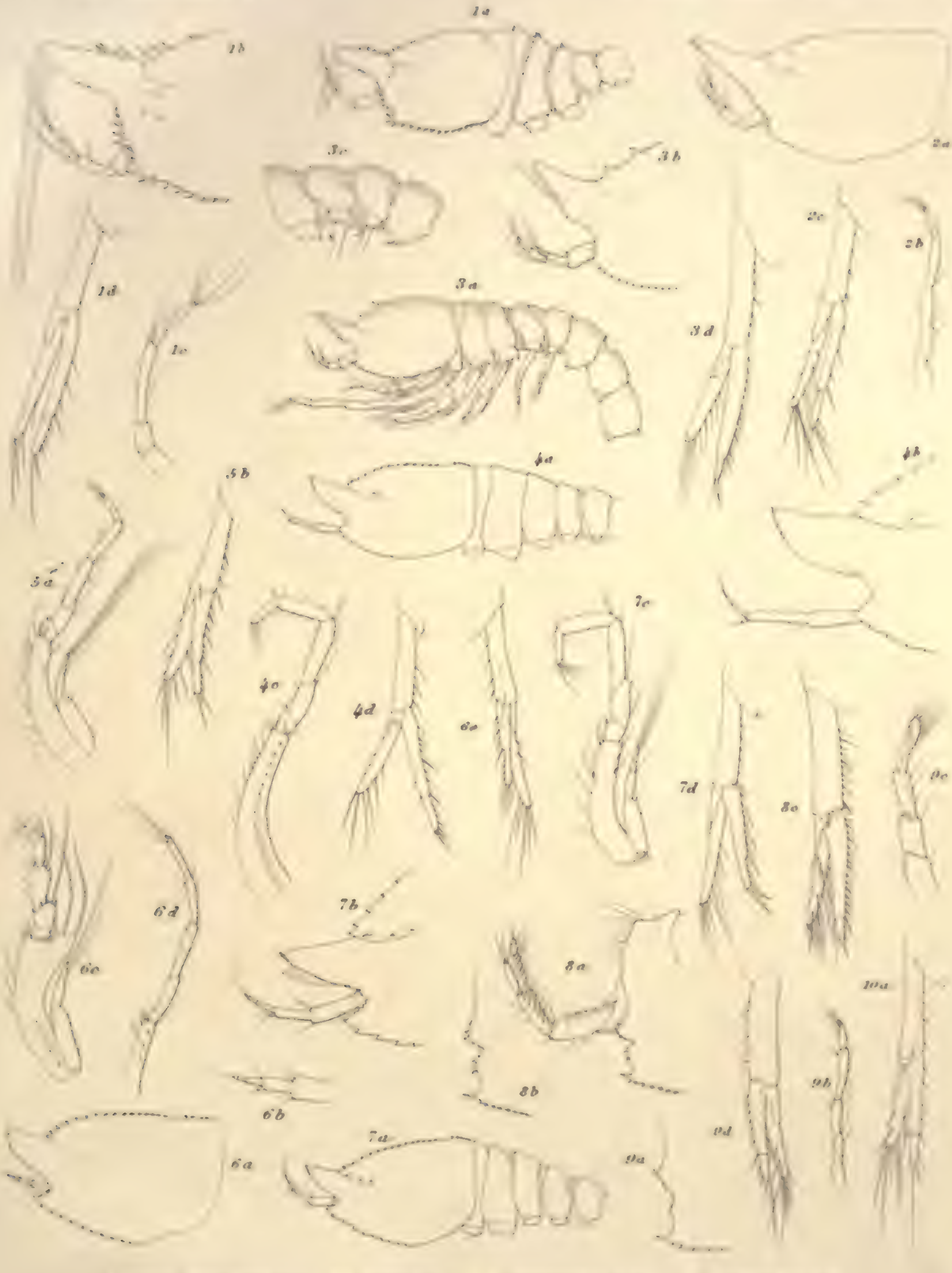
Fig. 10 a. Front end of the head with right eye, antennula and antenna of an adult female, from the right side; × 13. *h*. parts of the head. The ciphers at antennula and antenna indicate the number of the joints.

Fig. 10 b. Left maxillula, from below; × 23. Distal part of endopod omitted. *1*. first joint; l^1. its lobe; *2*. second joint, without lobe; *3*. third joint with its lobe, l^3; *4*. fourth joint. The membranous parts light greyish.

— 10 c. Left maxilla, from below; × 23. *1*. first joint, scarcely marked off from second joint, *2*; l^2. bipartite lobe of second joint; *3*. third joint, with its bifid lobe, l^3; *ex*. exopod.

— 10 d. Left third thoracic leg, from behind; × 17. Major part of the setæ on the terminal joint end on the inner margin of the two preceding joints omitted. *1*. first joint; *2*. second joint, bearing the epipod; *3*. third joint, bearing the exopod.

— 10 e. Proximal part of left third abdominal leg, from the outer side; × 11. *t*. tergite of the segment; *1*. and *2*. chitinized plates of first and second joints in the leg; *3*. proximal part of third joint. The membranous part light greyish.



1 Leucon spinulosus n. sp. 2 L. tener n. sp. 3 L. spiniventris n. sp. 4 L. profundus n. sp.
5 L. Nathorstii Ohlin. 6 L. serratus Norm. 7 L. robustus n. sp. 8 Eudorella hispida Sars.
9 E. arctica n. sp. 10 E. parvula n. sp.

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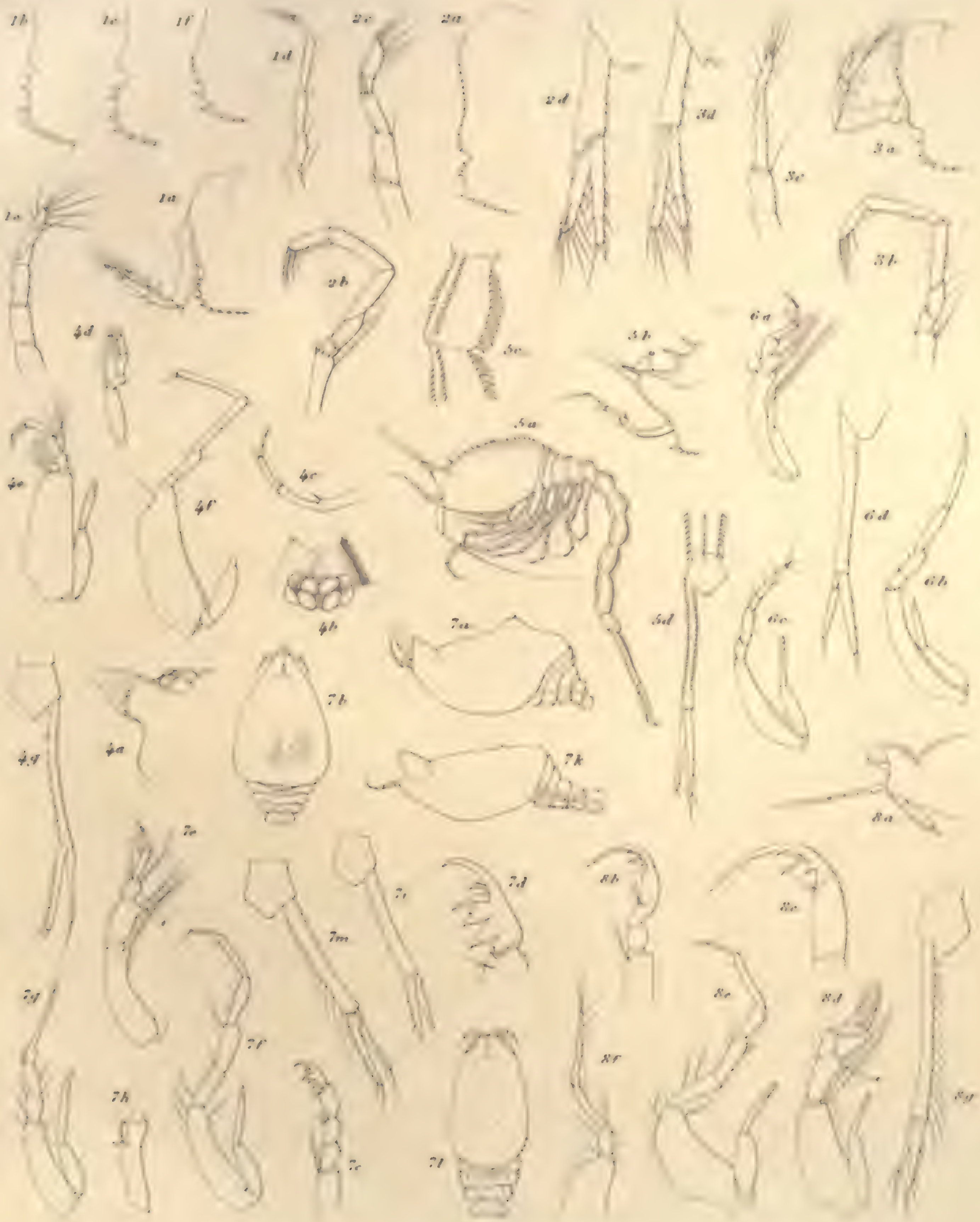

1 Eudorella parvula n. sp. 2 E. intermedia n. sp. 3 E. aequiremis n. sp. 4 Cumella tarda n. sp.
5 C. egregia n. sp. 6 Cumellopsis Helgae Calm. 7 Procampylaspis bituberculata n. sp.
8 P. macronyx n. sp.

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1 Campylaspis rubicunda Lilljeb. 2 C. alba n. sp. 3 C. laticarpa n. sp. 4 C. undata G.O.S.
5. C. rostrata Calm. 6 C. intermedia n. sp. 7. C. horrida G.O.S. 8. C. verrucosa G.O.S.
9. C. globosa n. sp.

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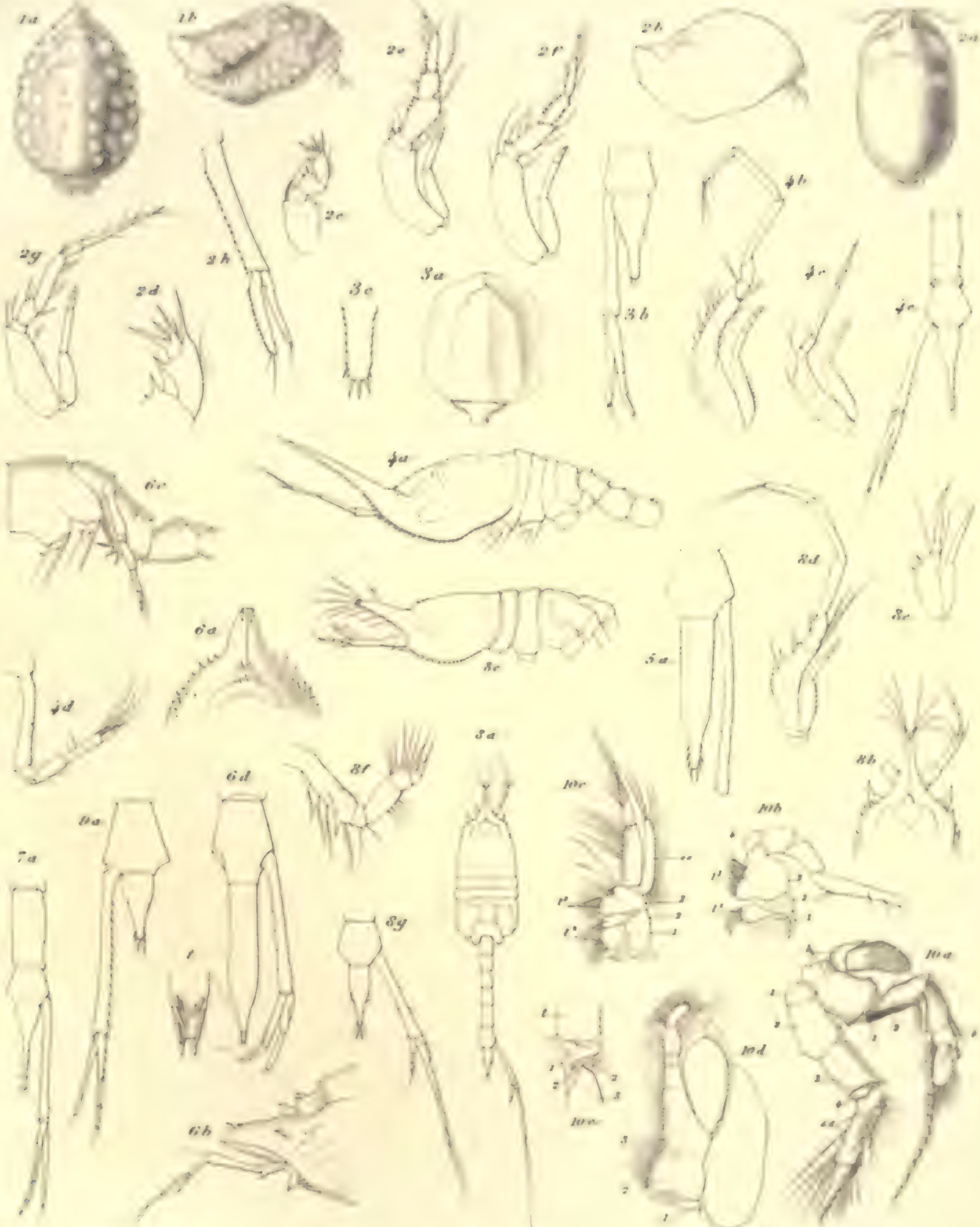

1. *Campylaspis globosa* n. sp. 2. *C. serratipes* n. sp. 3. *Platysympus tricarinatus* n. sp. 4. *Diastylis hastata* n. sp.
5. *D. longicaudata* Bonn. 6. *Makrocylindrus spiniventris* n. sp. 7. *Diastyloides scabra* n. sp.
8. *Brachydiastylis nimia* n. sp. 9. *Leptostylis grandis* n. sp. 10. *Nebalia bipes* O. Fabr.

H. J. Hansen del. P. N. Møller sc.

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	1°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° 07'	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					

THE DANISH INGOLF-EXPEDITION.

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