West of North Iceland: 65° 00′ N. L., 28° 10′ W. L., young-fish trawl, 1000 m. wire out, depth of the sea 1240 m.; 2 spec.

South of Iceland: 61° 34′ N. L., 19° 05′ W. L., young-fish trawl, 1800 m. wire out, depth of the sea 2160 m.; 4 spec.

South of Iceland: 61° 30′ N. L., 17° 08′ W. L., young-fish trawl, 1800 m. wire out, depth of the sea ? m.; 8 small spec.

South of Iceland: 62° 47′ N. L., 15° 03′ W. L., young-fish trawl, 1500 m. wire out, depth of the sea 1950 m.; 1 spec.

Distribution. On the European side of the Atlantic, this species has been taken in the Bay of Gascony, 425 fm. (Caullery), off Portugal, 1378 fm. (A. Milne-Edwards), south-west of the Azores, 1675 fm., and at the Canary Isles, 1675 fm. (Sp. Bate), also south of the Cape Verde Isles at 2128 fm. and in the vertical net from 0 to 213 fm. (Ortmann). In the Mediterranean it has been taken at Messina (Riggio) and near Monaco, at the last place in a large net sunk to a little over 1000 fm. (Lo Bianco). It has also been taken northwest of the Bermudas, 2675 fm. (Sp. Bate) and at a number of places off the east coast of America between 31° 41′ N. L. and 42° 2′ N. L., the depths varying from 105 to 2949 fm. (S. I. Smith). But Smith writes further (Rep. Comm. Fish... for 1885, p. 63), that a single specimen was taken "at the surface in a dip-net, and was kept alive for half an hour". This and another reason given induced Smith to write: "These facts lead me to suppose that this species is not a habitual inhabitant of the bottom at great depths, but more probably a truly free-swimming inhabitant of some part of the vast region intermediate between the surface and the bottom, such a one as might occasionally stray to the surface or to considerable depths". The observations mentioned by Ortmann and Lo Bianco of specimens taken in the vertical net agree with this. To judge from the structure of the animal and from the 4 catches made by the "Thor" in 1904, Smith's supposition seems quite justified.

Whether the specimens referred by Faxon (Mem. Mus. Comp. Zool. XVIII, p. 161) with a query to *A. Agassizii* really belong to this species, I am unable to determine; they came from the Pacific in the Gulf of Panama and somewhat further south.

Remarks. It is perhaps right to add that the specimens investigated by me certainly belong to the *A. Agassizii* so well described and figured by Smith; in referring it as synonym to *A. purpurea* I have only followed the authors. — At the time of capture of the specimens taken by the "Ingolf" at St. 11 and St. 12 it was noted: "animals clear, blood-red all over, eyes black".

72. **Acanthephyra gracilis** S. I. Smith.

! 1882. Miersia gracilis S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 70, Pl. XI, figs. 4—4d; Pl. XII, fig. 10.
1886. — — S. I. Smith, Rep. Comm. Fish and Fisher. for 1885, p. 672.

Occurrence. The "Ingolf" has not taken this species but it was brought home in 1904 by the "Thor" from the following locality.

South of Iceland: 62° 47′ N. L., 15° 03′ W. L., 1950 m., young-fish trawl, 1500 m. wire out; 1 spec.

Distribution. The species was founded on a specimen taken off the east coast of America

at 34° 28′ 25″ N. L., 75° 22′ 50″ W. L., 1632 fm.; later, a specimen was taken somewhat more to the north, namely, 36° 05·5′ N. L., of the same coast at 2512 fm. In 1905 a number of specimens were captured by the "Thor" in the young-fish trawl at two stations respectively west of the Channel and west of Brittany. The species is a bottom form certainly just as little as *A. purpurea.* The length of the wire out was in five catches respectively 1800, 900, 300, 300 and 200 m.; with 200 m. out only quite small specimens were taken, while the two largest specimens were taken with 1800 and 900 m., and with 900 m. both large and rather small specimens were taken.

Remarks. In his above mentioned paper Stanley Kemp refers *A. gracilis* Smith as a synonym to *A. debilis* A. M.-Edw. Not having seen the French author's figure I have no opinion on the question. My specimens agree well with the description and figure given by Smith, but not so well with Kemp's description and figures of *A. debilis.* The lateral plates of the fifth abdominal segment have their posterior margin less convex than in Kemp's fig. 4 and possess nearly always the marginal tooth pointed out by Smith. Further, the telson has several dorsal pairs of spines in front of the large pair, and the terminal part beyond the last pair of spines is considerably longer than shown by Kemp. Finally, I cannot see any vestige of the luminous organs described by Kemp. For these reasons I must leave the question of synonymy to future investigators.

73. **Acanthephyra Batei** Faxon.

Pl. IV, fig. 2 a (named *A. brevirostris*).

1888. Acanthephyra brevirostris Sp. Bate, Rep. Challenger, Vol. XXIV, p. 751, Pl. CXXVI, figs. 5—6.
1897. — batei, Faxon, Mem. Mus. Comp. Zool., Vol. XVIII, p. 167.

Occurrence. The "Ingolf" has not found this species but it was brought home in 1904 by the "Thor" from the following locality.

South of Iceland: 61° 30′ N. L., 17° 08′ W. L., young-fish trawl, 1800 m. wire out; 1 spec.

Distribution. The species was founded on two specimens taken in the Atlantic at 1° 22′ N. L., 26° 36′ W. L., 1500 fm. No other specimens are mentioned in the literature. The species is certainly not a bottom form; the specimen examined by me can scarcely have been in greater depths than ca. 400 fm., so that it was living pelagically in the intermediate layers.

Remarks. The "Thor" specimen is 60 mm. long. The carapace is greenish, lighter or darker chiefly according to the colour of the tissues underneath. The dorsal aspect of the first three abdominal segments is gray-green, the lateral surfaces much lighter. The carapace is furnished with a high, sharp keel along the whole length of the median line; the front part of this keel and the rostrum together with 10 dorsal spines, the rostrum which is somewhat bent upwards with 1 spine, at the middle of the lower margin; the rostrum is more strongly bent upwards that Bate's fig. 5 shows. The lateral keel of the carapace begins a little behind the orbital margin, continues right to the posterior margin and is very obvious. The first and second abdominal segments have no dorsal keel, the four following have a sharp dorsal ridge along their whole length and on the 4th to the 6th the ridge runs out into a fairly small spine. The telson has 3 small spines on the sharp distal section of each of the two ridges; the truncated end has 5 spines, of which the lateral pair are long, the three others

THE DANISH
INGOLF-EXPEDITION.

VOL. III, PART 2.

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H. J. HANSEN: CRUSTACEA MALACOSTRACA. (I.)

PUBLISHED AT THE COST OF THE GOVERNMENT

BY

THE DIRECTION OF THE ZOOLOGICAL MUSEUM OF THE UNIVERSITY.

COPENHAGEN.

H. HAGERUP.

PRINTED BY BIANCO LUNO.

1908.

THE DANISH INGOLF-EXPEDITION.

VOLUME III.

2.

CRUSTACEA MALACOSTRACA. I.

BY

H. J. HANSEN.

WITH 5 PLATES AND 4 FIGURES IN THE TEXT, 1 CHART, AND A LIST OF THE STATIONS.

TRANSLATED BY DR. H. M. KYLE.

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Crustacea Malacostraca.

Crustacea Malacostraca.

By

H. J. Hansen.

Introductory Remarks.

It will be useful to introduce the treatment of this sub-class with a discussion of various points of importance.

The investigations of the «Ingolf» extended over the eastern part of the seas along the west coast of Greenland from a point a little north of the polar circle to about 58° N. L., two degrees south of Cape Farewell, from there in a north-easterly direction towards Iceland, the waters round this island and between Iceland and the Færoes, lastly eastwards to a line drawn almost due north from the Færoes to Jan Mayen. It goes without saying that all the material brought home by the «Ingolf» is included in the following pages, but I have also thought it right to include all the material which other Danish expeditions, special zoologists or others not experts (officers of the navy or officials in our northern dependency) have collected at Greenland, Iceland and the Færoes, and which is preserved in the Copenhagen Museum; further, I have included the species given in the literature as having been taken within the region mentioned and which are not represented in our Museum, at least from those areas. The waters included are thus the Davis Straits, Baffins Bay and the narrower seas north of this to as near the pole as the «Alert» and «Discovery» reached, the seas south of Greenland to ca. 58° N. L., those along the east coast of Greenland to ca. 75° N. L., the waters west of a line from the Færoes northwards to 68° N. L., $6^2/_3$° W. L. and from there to Jan Mayen (at ca. 71° N. L., 8° W. L.), the waters south and south-west of Iceland to ca. 60° and the sea south and south-west of the Færoes likewise to about 60° N. L. This work contains all that is known concerning the Malacostraca in the region thus circumscribed, both what our Museum and the literature can show.

Our Museum is rich in Crustacea — especially Malacostraca — from the Færoes, Iceland and especially Greenland, and it may be permitted to mention here the principal sources (apart from the «Ingolf»). At the Færoes, Dr. phil. Th. Mortensen has made a very considerable number of dredgings from low water out to ca. 100 fm.; a number of forms has also been received from Dr. med. F. Jørgensen. At Iceland, collections have been made especially by Dr. phil. A. C. Johansen and Mag. sc. R. Hørring both of whom have also made collections at the Færoes during short sojourns there; Mag. sc. W. Lundbeck has also collected a by no means small material in the Icelandic fjords, and Vice-Admiral C. Wandel has brought home a number of forms from the deep water round Iceland (and from Davis Straits); several others, as Mag. sc. A. Ditlevsen, Cand. mag. B. Sæmundsson,

Mag. sc. H. Jónsson, First Lieutenant in the navy E. Jensen have made smaller contributions. In 1903 and following years Dr. J. Schmidt the leader on the investigation-steamer «Thor» collected a large material of Crustacea, both pelagic and bottom forms, in the waters round the Færoes and Iceland, especially south of Iceland. Dr. Schmidt has brought home a number of Euphausiacea and Mysidacea, as also some Decapoda, which have not previously been taken within the region mentioned.

In my earlier work on the Malacostraca from West Greenland, I have given a complete list of the Danish and Swedish sources from which the material then described was derived; I may therefore merely refer here to that report, published in 1887. Since then, Prof. D. Bergendal (of Lund) and Mag. sc. M. P. A. Traustedt have made a number of dredgings at several places along the west coast of Greenland and have each brought home forms of interest; smaller contributions are due to Captain in the navy C. Ryder, Pastor H. Sørensen and others. Further, considerable tracts along the east of Greenland from ca. 65 1/2 N. L. to ca. 74 1/2 N. L. have been investigated by three Danish expeditions, conducted respectively by Capt. in the navy C. Ryder in 1891—92 and by Capt. in the navy G. Amdrup in 1898—99 and 1900. On the first of these expeditions the collections were made by Cand. E. Bay and Cand. med. H. Deichmann, on the last two by respectively Cand. med. K. Poulsen and Mag. sc. Søren Jensen. Lastly, Mag. sc. C. Kruuse has brought home a number of forms from the region about Angmagsalik.

In addition to the mentioned sources of the material dealt with here there is still another, but it must be mentioned by itself. In 1902 Dr. J. Hjort carried out investigations with his steamer «Michael Sars» in the waters between the Færoes and Shetland, also east, south and south-west of the Færoes and to a small extent north-west of these islands. Cand. mag. Ad. Jensen was one of the accompanying naturalists and brought home numerous Crustacea — especially the smaller forms living on hydroids etc. — but the great majority of the class mentioned were collected by Dr. A. Appellöf and taken to the Bergen Museum. A part of this material, which came from the warm area, was at my request kindly handed over to me for investigation and is included in the following pages.

It is a relatively moderate number of species of Malacostraca which have been collected by one or several of the Danish or foreign expeditions which have not likewise been taken by the «Ingolf». On the other hand the «Ingolf» has taken hundreds of species which have not been found by any other within the waters in question, and a large number of these species are also new to science. This with the foregoing explanation is the reason why I have included and endeavoured to collect in one place all that could be found in the Copenhagen Museum and in the literature, in order to throw light on the Crustacean fauna of the waters round our northern dependencies. — My paper on the Malacostraca of West Greenland, published in 1887, was based almost to an equal extent on material belonging to the Copenhagen Museum and to the Riksmuseum in Stockholm; our Museum's part of that material has again been examined along with the material from the «Ingolf». Where many localities are noted in the work mentioned for any species only a summary of these is given here, but if very few localities are mentioned these are again noted; errors in determination are, it need hardly be said, distinctly pointed out.

Under «occurrence» are given the discoveries within the region definitely defined above for the purpose of this investigation; under «distribution» the localities outside this region. Both and especially the distribution have caused the author considerable practical difficulties and some remarks on this subject will for several reasons be of service. All the «Ingolf» localities are mentioned under each species. On the other hand, it would take up far too much space to give all the localities for a number of common species living in shallow water, especially for a no small number of Decapoda; in such cases I have contented myself with summaries for each main section of the coasts. In many cases, however, it is a matter of opinion how much might be usefully included and the correctness of the view adopted may indeed always be combated; some will undoubtedly think that I give too many details, others perhaps that I give too few. While it is difficult enough sometimes to find a suitable mean with regard to how many details based on our own investigations should be given, it becomes still more difficult to determine how much should be noted of the data of other authors concerning the occurrence of any species within the region mentioned. Sometimes the inclusion of such data is superfluous as I myself have seen the species from the same and quite adjacent localities, yet the exclusion of a citation may sometimes be considered as due to lack of knowledge or a slight. In other cases these older data are of doubtful quality — sometimes even the supposed data prove incorrect when the author's specimens are examined — so that the question of their inclusion or omission becomes even more difficult. If I were to indicate all the earlier notices and in every little case of doubt give a criticism, I should certainly succeed in securing myself against the complaint mentioned, but it is very doubtful whether I should advance science by being so unnecessarily prolix. What I include of the literature therefore depends upon personal opinion, but I have endeavoured to give a correct and complete picture for each species.

The distribution both geographical and bathymetric is given for each species. We often meet with a kind of list of the distribution of each species in the literature, but such a list's contents are too often defective, inexact or uncritical. It is defective when the author has passed over older and probably correct data of localities of real interest, it is inexact when the author for example mentions Greenland without distinguishing whether a form is known from one of the two so diverse seas as those at West Greenland and North-East Greenland (from the more southerly East Greenland only a little is known from Angmagsalik). And it is not rarely tangibly uncritical, which is the worst, when one finds in a list statements of occurrence or distribution which depend upon incorrect determinations on the part of the author or his predecessors. In the Decapoda, Mysidacea and two other smaller orders there is fortunately slight possibility of difficulties of this kind, but it is very common in the Tanaidacea for example and especially the Amphipoda. These shortcomings have obliged me, especially for the Decapoda, to undertake a work which I found very great, possibly greater than the matter was worth from the present standpoint of our knowledge, in order to give a somewhat complete and at the same time as far as possible critical report on the geographical distribution of many species — so far as this is known at present. But it has to be added, that there are very few species of which it may be said that our knowledge is complete, the boundaries either in America, or north of Asia, or in the south of Europe or west of Africa being very imperfectly known. It is also the case, at least for a number of species, that the depth at which a given form occurs in one sea is much less than

that at which the same form occurs at least as a rule and often exclusively in another sea. Certain species which are found in the Kara Sea at less depths than 100 fm. are only met with in the cold area of the northern Ocean at several hundred fathoms; thus *Eusirus Holmii* H. J. H. was founded on specimens from 91 and 93½ fm. in the Kara Sea; in the waters N. W. of Spitsbergen the Norwegian North-Atlantic Expedition took it in 260 fm.; in the waters between Jan Mayen, Iceland and Norway the same expedition found it at two stations, the «Ingolf» at seven, and these nine stations were at depths from 293 to 780 fm. In the Kattegat some species occur in shallower water than anywhere round our northern dependencies. It may thus be of importance to know, not only the least and greatest depth at which a species occurs within its territory taken as a whole, but also the limits of depth for its occurrence in different parts of the same territory. Unfortunately gaps probably occur in my account of some species with regard to their occurrence on the Atlantic coast of the Spanish peninsula and at the Canary Isles, the reason being that the necessary literature is not available in Copenhagen.

Some remarks may perhaps be added here on faunistic catalogues. The literature on the Malacostraca is rich in such lists, but unfortunately several and sometimes indeed not a few of the determinations in the most of these works are not to be depended upon and sometimes even demonstrably incorrect. This is just the great danger in using faunistic catalogues, namely, that one cannot be sure in numerous cases that the determination is correct; by carefully using several systematic papers or a single large paper of an author, one gets to know the extent of his carefulness and of his observing and critical abilities, and from this knowledge one may judge of the trustworthiness of his determinations of species, when he has not included in these any remarks on structural features from which one can to a certain extent or with certainty conclude for oneself, whether the determinations are correct. But even the most careful and keen-sighted author does not escape on occasion from making an error in determination, which often cannot be detected at all in a faunistic list. The best list known to me with numerous descriptions of new species are those in the excellent papers of S. I. Smith on the Decapoda of the east coast of North America. Even the list prepared by G. O. Sars on the Crustacea of the Norwegian North-Atlantic Expedition contains several errors, at least as regards the Isopoda and Amphipoda, which he has corrected later in his splendid work, «An Account of the Crustacea of Norway». But when a author so prominent and with such detailed knowledge of Norwegian Crustacea could make several such errors of determinations in a large work like that on the forms of this class taken by the expedition mentioned, confidence in the trustworthiness of faunistic catalogues must decline to a great degree. There are also various lists in which I can place no confidence for a number of species, even though such lists may display many citations and thus show knowledge of the literature, for the reason that this learning is not necessarily accompanied by exact investigation or by critical judgment etc. My confidence in catalogues of species is constantly growing less and less as the years go on, the more so as various journeys have given me the opportunity of finding out very remarkable errors of determination in earlier works on examining the original specimens. It is almost desirable that authors would be less industrious in publishing faunistic lists, especially those on difficult groups and on the fauna of a small stretch of coast, or frequent small additions to older lists.

Nevertheless, I am myself guilty here of publishing a faunistic list. It would, however, be meaningless to give new descriptions of the species (with figures) of all the northern-arctic Decapoda, most of which have been described several or even many times, and for example to describe and figure the Cumacea, Isopoda and Amphipoda which have been so excellently dealt with in Sars' standard work mentioned above. But wherever on going through my large material I have met with a noteworthy difference between my specimens and the work noted by me as the chief publication regarding the species in question, I have displayed the differences discovered by notes and often likewise by figures, so that a possible error of determination may be controlled by a successor, who in one or other regard has better material or more critical ability. With this object in view I have marked with ! the work or the two works for each species which contain the best description of the form; also, under «remarks» I have sometimes briefly mentioned one or several of the principal specific characteristics. I have thus done what I could to give the users of this work the greatest possible control as regards my own determinations, and hope further that these measures of circumspection may be a good example to others who in future wish to publish faunistic catalogues of Crustacea.

With regard to species which have been described several or many times it has seldom been my intention to refer to all the previous descriptions and figures in the synonymy list. I only give a greater or less selection which always contains the first description and the one or two best (marked as mentioned above). In the synonymy list no reference is ever given to mere lists of names, and reference is only made to a work if it contains either a description or a figure or at least remarks of importance for the recognition of the species. I may add, that I have always used the works cited under each species, except in the cases where these were not available and then I mention the source of my citation. It is very common to find that authors give citations of descriptions of a species and of localities, where these are only mentioned in the same way, so that one cannot see whether there is in the work cited only a name and some localities or likewise a description; in this way the synonymy list swells up to an unreasonable extent and at the same time becomes not nearly so reliable or so useful as a list much shorter but carefully chosen. Another and not very rare bad habit is that an author, in a synonymy list for example, cites a treatise he either does not know or has not looked at in the case in question, but has copied it from another's list; it happens that such slackness can be detected, when the author in his citation includes the written or printed error found in the citation of his predecessor by a third person. Under «occurrence» and «distribution» I have generally given for each locality or small group of localities the author or the authors as the source of information but not mentioned the works; and except where the contrary is stated I have everywhere examined the source myself. It is only when I have studied specimens from the same coast that I omit frequently any reference to earlier notices; where therefore no author is named for a locality or for several localities mentioned immediately after one another, that means that our Museum owns the species in question from these localities.

For a large number of the earlier described species I have given the length — sometimes also other measurements — of the largest specimen seen by me, as also the place where it was taken; in several cases these sizes are greater than those hitherto known for the species in question. For some

forms there has been occasion to describe changes in the size of the species according to the localities with a little more detail.

It is not possible at this place to give the more general results which may be deduced from the following account of the data. When the Malacostraca (and in the end all Crustacea) are completely worked out, it will be possible to give a summary such as that mentioned and to base it securely on references. A few introductory remarks will be given for the separate orders, but on the other hand it has been considered unnecessary to give lists of the literature.

Lastly, the author wishes it to be distinctly understood that his beginning with the Decapoda does not mean that he considers them higher than the other orders. The arrangement of the orders has nothing to do with this question, as it has been chosen out of regard for considerations which have nothing to do with the systematic arrangement of the Crustacea, namely, such as were imposed by the work itself and which tended only to make a convenient subdivision of the work for the author and for publication.

I. The Order *Decapoda.*

Although the order Decapoda could very naturally in my opinion embrace the *Euphausiacea* the distance between *Euphausia* and *Sergestes* and *Peneus* not being greater than that between *Peneus* and *Homarus* or between *Homarus* and *Dromia*, yet I have placed the Euphausiacea here as an order by themselves.

It seems to be an insoluble task to divide this order in a perfectly natural manner into suborders. Some authors hold to the old division of Brachyura, Anomura and Macrura (to which the Euphausiacea might thus be added as a fourth suborder); the division is very practical but not of great scientific value. Other authors accept the division made by J. E. V. Boas in 1880 into Reptantia and Natantia. That these two names are in themselves badly chosen is naturally of minor importance if the division otherwise were good. It should be noted, however, that the great majority of the Natantia are bottom-animals, some even live in holes in coral blocks or in sponges; it is also interesting to notice that the few genera, whose representatives really swim in the upper or deeper water-layers, always so to speak possess peculiar characteristics; thus the two posterior pairs of thoracic legs in *Sergestes* are modified to true swimmerets while *Pasiphaë*, *Hymenodora* and *Acanthephyra* have retained in use the outer branches of the thoracic legs; lastly, *Polybius Henslowi* which belongs to the Reptantia and lives a true pelagic life has all four pairs of its walking legs transformed to swimmerets. But, for the rest, I may spare myself the trouble of giving further proof of the bad quality of the two diagnoses, each with ca. 30 characters, which Boas sets up for his two suborders mentioned. In «Germanisering af Dansk Videnskab", Copenhagen, 1895, I have reviewed each of the characters in question one by one and showed that of all the 30 characters there is only one (or perhaps $1^1/_2$) which really holds good — and in the same year the quality of the character left was criticised by Th. List.

In my opinion it will prove impossible to divide the order Decapoda into 2, 3 or 4 suborders

in a completely satisfactory manner, but on the other hand one can set up a long series of excellent groups with one to several families in each group. Meanwhile, for the sake of a general view, the old division into Brachyura, Anomura and Macrura is retained.

The "Ingolf"s catch of Decapoda was relatively not large; the northerly seas, as is well-known, are tolerably poor in species of this order. Nevertheless, the following account will give an important addition to the geographical distribution towards the north of a number of the deep-water forms known from somewhat more southerly regions of the Atlantic. Especially interesting in this regard is a comparison with the fauna known, as the result of the American deep-water investigations and S. I. Smith's excellent descriptions, from the tract between ca. 35° and 45° N. L. off the east coast of America. It appears that most of the deep-water species collected by the "Ingolf" outside of the cold area are noted by Smith from the region mentioned, but this author has certainly three to four times as many species as the "Ingolf". The Danish ship has not made nearly so many hauls in deep water on bottom with positive temperatures as the Americans; if we had had several times more dredgings from the waters south of southerly Greenland, we should quite certainly have obtained many more of the species known from about 40° N. L., but I doubt whether we should have got much more than the half of Smith's species. Although the investigations are thus far from sufficient to show the true extent of the decapod deep-water fauna of the most northerly parts of the Atlantic in comparison with that of more southerly latitudes, yet the following account will give very interesting and new information regarding the distribution of a number of more southerly species far to the north in deep-water areas, the coastal fauna of which has a somewhat arctic character. On the other hand, it can be said that of the Decapoda living from the beach down to ca. 200 fm. in the waters round Greenland and Iceland as also on the north and west sides of the Færoes extremely few species will be discovered in future which are not dealt with in this work. More exact knowledge however may naturally be gradually obtained of the geographical and bathymetric distribution of the various species within the region mentioned, and especially a much more complete knowledge than the present concerning the temperature occurring at the coldest and in the warmest periods of the year in the depths in which the species live at their different localities.

After these remarks this may perhaps be a suitable place to insert some critical notes on an apparently somewhat variable yet very wide-spread view regarding what is meant by arctic and boreal or subarctic, that is, on the zoogeographical question concerning the fauna, both coastal and deep-water fauna, in the more northerly seas of the globe. It is in other words the marine Arthropoda in the great, as yet incomplete, work Fauna Arctica published by F. Römer and F. Schaudinn — which requires a closer investigation. Most of the contributions published hitherto (1906) are almost entirely compilations, as the material the various contributors have had from the "Helgoland" Expedition is comparatively speaking extremely small. One of the carcinological papers in this work is almost quite useless, and of others it may be said that their plan and execution are so unfortunate that they will certainly contribute more to confuse than to clear up the ideas on arctic and boreal fauna in the minds of the majority of the Zoologists who may use them. I was led into this literary investigation by becoming acquainted with Dr. F. Doflein's treatment of the Decapoda in "Fauna Arc-

tica" (B. I, p. 313—62), and it will not be denied that I have the most valid reasons possible for making a very detailed reference to this work, which deals with all the Decapoda taken north of 60° N. L. and likewise includes a number of forms only taken much farther south. Further, in an extensive foot-note I shall make some remarks on one of the other papers so far published on the Arthropoda in "Fauna Arctica", namely, the work on the Pantopoda; this latter work is in one way excellently suited to serve as a type and there are also special reasons for mentioning it more particularly, as the work on the "Ingolf's Pantopoda is referred to in it.

As an introduction to my remarks on the part of "Fauna Arctica" which concerns me most, the following may be mentioned. A destructive criticism of the principle underlying the choice of the boundary between arctic and boreal fauna, which is followed by H. Ludwig in his treatment of the Holothurida (and Asterida) in the work mentioned, has come from Dr. Hj. Östergren (Bergens Museums Aarbog 1902, No. 9). Östergren states, that Ludwig has simply taken the polar circle (i. e. $66^2/_3$° N. L.) as this boundary-line, whereas it has long been known, that on the American coast Cape Cod at 42° N. L. forms the boundary between the arctic and the boreal coastal fauna, and on the other hand the west coast of Norway and its fjords right up to the North Cape, 71° 10′ N. L., has an essentially boreal fauna both as regards even the more littoral (0—50 fm.) and especially the areas in deeper water (100—400 to 500 fm.). He does not enter into details regarding the more littoral fauna from the North Cape to Nova Zembla. The geographical boundaries for the true deep-water fauna are entirely different, as the cold area of the Northern Ocean with bottom-temperatures under 0° C. extends between the ridge off Norway on the one side and Iceland and the Færoes on the other, then in between the Færoes and Scotland almost to 60° N. L. (the boundaries of the cold area can be seen in the work on the Norwegian North-Atlantic Expedition), and with Östergren one may suitably choose 0° C. as the boundary for the arctic deep-water fauna. It may be recalled here that we find positive bottom-temperatures to the west of the cold area, and the deep water of the Atlantic with a part of its fauna pushes up into Denmark Straits and Davis Straits.

Ludwig's work is chiefly a compilation, and Østergren shows a number of errors of different kinds and origin. But Ludwig in the opinion of Zoologists expert in his subject has published extremely valuable systematic papers on Holothurida etc., whilst several of the other contributors to "Fauna Arctica" have certainly known comparatively little of the groups on which they wrote, a fact which now and then is not without some influence on the compilation.

We may turn now to the consideration of Doflein's work on the Decapoda. On p. 316 the author writes: "Ich habe mich — — — zu einem Kompromiss entschlossen, indem ich diejenigen dekapoden Krebse aufführe, welche die Meere nördlich von 60° n. Br. regelmässig beherbergen; dabei habe ich aber die Angehörigen arktischer Familien, welche sich infolge von besonderen Verhältnissen weiter nach Süden ausbreiten, mitberücksichtigt, so besonders die Bewohner der Kaltwassergebiete an der Ost- und Westküste von Nordamerika. Haben doch die Erfahrungen der letzten Jahrzehnte bewiesen, dass Tiefseeformen südlicher Gebiete nicht selten das Flachwasser der kalten Zonen bewohnen; — — —". If the "südliche Gebiete" mean the Gulf of Gascogne or the region explored by the "Travailleur" and "Talisman", it will be extremely difficult and probably impossible, to show a single

species of Malacostraca which occurs as a deep-water form within these parts of the Atlantic and at the same time in "das Flachwasser der kalten Zonen". Using the statement cited as basis Doflein has included a number of species of Lithodinæ, even two which are only known from San Francisco in California. It is thus unfortunate for him that no species of the group Lithodinæ is arctic, not even *Lithodes maja,* which is not littoral, nor so far as I know found anywhere in negative bottom-temperatures. It is a typically boreal species which extends into the Murman Sea and has been taken west of Bear Island, in nearly 100 fm. and at West Spitzbergen. This being the case, Doflein's long list of Lithodinæ can only serve to confuse the view. His "Uebersicht der horizontalen und vertikalen Verbreitung der arktischen Decapoden" (p. 359) in which there should only be "die sicheren und im arktischen Gebiet nachgewiesenen Arten" contains for example several typical Atlantic forms, which are neither arctic nor taken in arctic waters, as will be shown later in dealing with the separate species.

We read on p. 360: "Die Schriften von Hansen waren mir leider unzugänglich"; at the same place however he gives the titles of the two largest of my (3) papers, which are of special importance here, namely, the paper in the "Djimphna" Expedition and that on the Malacostraca of West Greenland. These two papers are however sometimes found to be on sale in German second-hand booksellers' shops (according to their catalogues) and in any case they are still the principal works on all the Malacostraca from the waters along West Greenland (60°—73° N. L.) and the Kara Sea, which two seas ought to have had some interest for the author. Had he obtained these papers he would have been able to escape for example so patent an error as is contained in almost all his statements on *Sclerocrangon salebrosus.* He has also been unfortunate however with a fourth of my papers. He has, namely, two species of *Sergestes* and refers in the synonymy list under *S. Meyeri* Metzg. to my work in the Proc. Zool. Soc. 1896, but as he does not mention what I have stated about *S. Meyeri* nor the page, he has obviously not seen my paper, and I must suppose that the Proceedings Zoolog. Society of London have also not been available to him. His lack of knowledge of my paper has however brought misfortune to him, as I show in it that the two species he constantly gives as distinct are identical and should have the name of the second, *S. arcticus* Kr. Again, in 1858 M. Sars wrote concerning *Stenorhynchus rostratus* L. that "in the north it does not reach to Greenland", and concerning *Carcinus mænas* that it "is lacking at Greenland". Under both species Doflein (p. 351 and 355) cites this very work of M. Sars ("Oversigt over de i den norsk-arctiske Region forekommende Krebsdyr", Videnskabsselsk. Forhandl. for 1858) as the source for the statement that they were taken at Greenland. One might here indeed blame M. Sars for causing a future eager compilator in his haste to read wrongly, because the word "Greenland" was named under these species. Dr. Doflein says in his "Einleitung" concerning the literature: "Wenn ich trotzdem keine absolute Vollständigkeit erreichen konnte, wovon ich überzeugt bin — — —", this his conviction has been in great degree correct — but one is then tempted to wonder whether, when such an extremely voluminous work of compilation is found in place after place to be uncritical, inaccurate or defective, there is not a great probability of its doing more harm than good. In the following pages it will be necessary for me to show various other inaccuracies in Doflein's work so as to contribute to their eradication. His remarks on *Sabinea septemcarinata* Sab. and *S. Sarsii* Smith (p. 328), on *Hippolyte spinus* Sow., *H. Phippsii* Kr.

and *H. macilenta* Kr. show that his investigation of nature is not any deeper or more trustworthy than of the literature[1].

A. Brachyura.

1. **Stenorhynchus longirostris** Fabr.

1775. Cancer longirostris J. C. Fabricius, Syst. Entom. p. 408.

! 1863. Stenorhynchus longirostris Heller, Crust. südl. Eur. p. 23, Taf. I, Fig. 1—2.

1900. — — A. M.-Edwards & E. L. Bouvier, Exped. Scient. du Travailleur et du Talisman, Crust. Dec., I, p. 156, Pl. XXII, fig. 6.

Occurrence. The "Ingolf" has not taken this species, but it is to hand from two other sources.

Færoe Bank (Dr. Jørgensen); 1 specimen.

— — 60° 55′ N. L., 8° 56′ W. L., 69 fm., temp. 9·3° ("Michael Sars", 1902); 1 spec.

The first-named bank is most probably the same as the second; it lies south-west of the Færoes.

Distribution. The locality just mentioned is the most northerly hitherto observed for the distribution of this somewhat southerly species. It was known previously however from 59° 12′ N. L., 5° 57′ E. L. (Norman), from the Shetland Isles (Norman), the Hebrides (Norman), further south in the Irish Sea (Walker), Cornwall and Devon (Norman), and places on the east coast of England, North-

[1] In "Fauna Arctica" B. 11 (p. 35—94) is found "Arktische und subarktische Pantopoden. Zusammengestellt von K. Möbius". In the "Allgemeiner Teil" (p. 38) we read: "— — — Michael Sars und G. Ossian Sars, sowie nach ihnen viele andere Faunisten des nordöstlichen Atlantischen Oceans betrachten den nördlichen Polarkreis als Grenzlinie zwischen dem Wohngebiet der arktischen und subarktischen Seetiere"; the number after G. O. Sars' name refers to a footnote which gives the title of Mollusca Reg. arct. Norveg. 1878. But in the cited work of Sars of 1878 this excellent author does nothing of the kind; on the contrary, he states (p. 2) that "the whole of the deep region along our southern and northern coast to North Cape thus belongs undoubtedly to the warm area, and the ice-cold water which fills the great basin below 300 fm. in the ocean lying beyond right to the level of Stadt (ca. 62° N. L.) is everywhere marked off from the coast by the long extended barrier — — —". This citation alone is surely sufficient to prove that Sars in 1878 already did not set the boundary "zwischen dem Wohngebiet" of the arctic and boreal mariñe animals at the Polar Circle. Sars did something quite different; he investigated the character of the fauna at the different places and then determined where it was arctic and where not. He brought into his work the forms found on the Norwegian coast north of the Polar Circle, but he showed that the fauna in deeper water along the west coast of Norway right to the North Cape was indeed not arctic. It is possible — though certainly extremely doubtful — that "viele andere Faunisten des nordöstlichen Atlantischen Oceans" have in the period from 1878 to 1900 considered the northern Polar Circle as the boundary between "dem Wohngebiet" of the arctic and boreal marine forms; if so, then these "Faunisten" have shown almost as little acquaintance with what they were writing about as a number of the authors in "Fauna Arctica". — Even if G. O. Sars had written in 1878 what K. Møbius ascribes to him, it would still never be permitted to retain such a view in our time after the publication of the Norwegian North-Atlantic Expedition Report and of the Hydrography in the "Ingolf" Expedition Report. In spite of some speculation I have not succeeded in understanding how any one could formulate the principle which the author employs in the elaboration of the lists given p. 41, on "rein arktische Pantopoden" and on those that are "Arktisch und subarktisch". The species which the "Ingolf" has taken in deep to very deep water with positive bottom-temperatures round the southern part of Greenland are noted as "arktische", if they are not known from more southern regions, otherwise as "arktische und subarktische" — and in both cases the procedure is perfectly incorrect. Thus, for example, *Pallene acus* Mein., *Pallene hastata* Mein. and *Pallenopsis plumipes* Mein. are made "rein arktische", but *Paranymphon spinosum* Caull., *Colossendeis colossea* Wils. and *C. macerrima* Wils. arctic and subarctic — in both cases quite incorrectly, as all 6 species are deep-water species in the Atlantic. Some of them were taken earlier much more to the south than by the "Ingolf", and all 6 might be expected to be distributed in the greater part of the Atlantic, a few even perhaps in the Pacific, but such species could not easily be considered either arctic or subarctic, just as little as the deep-water Decapoda taken at South Greenland mentioned in this work, for example, the two species of *Polycheles*, *Galacantha rostrata*, etc. That Möbius should make such references is all the more strange as, following Meinert, he gives both depth and bottom-temperature for the 6 species named. Such references can only do harm. — For the rest the work seems to be a careful summary of the literature and localities; the original contributions — in the form of remarks on some species — are, in agreement with the title of the treatise, extremely few; the whole might best be considered as almost superfluous literature of rather less use than the reverse.

umberland (Norman), S. E. from Yarmouth (Metzger), Belgium (v. Beneden), on the English-Normandy Islands (Koehler), Concarneau (Bonnier), Gulf of Gascogne and further south to the Canary and Cape Verde Islands to 17° N. L. (A. M.-Edwards and Bouvier). It also occurs in the Mediterranean (Heller, Gourret, Adensamer etc.) and is said to occur in the Black Sea (Czerniavsky, teste Ortmann).

Concerning its bathymetric distribution the following may be said. Bonnier states that it occurs in depths from ca. 5 to 30 fm. on the coast of Britany; Heller gives 25 to 40 fm. for the Mediterranean, Gourret ca. 10 to 33 for Marseilles Bay, Adensamer 54 to 62 fm. for the Adriatic Sea, Caullery 96 to 212 fm. for the Gulf of Gascogne, A. M.-Edwards & Bouvier 41 to 223 fm. for several places in the Atlantic (Cadiz to Cape Verde Islands), lastly 870 fm. for a single specimen taken off Morocco. The last I consider as improbable until further information is forthcoming, and believe that it has arisen from some error or another (e. g. that the specimen has been in the trawl from an earlier station). Apart from this it appears that the species occurs uniformly at all depths from ca. 5 fm. to a little over 200 fm., but that it is more rarely found in shallower water than 10 to 20 fm.

2. **Lispognathus Thomsoni** Norm.

1873. Dorynchus Thomsoni Norman, in Wyv. Thomson, Depths of the Sea, p. 174, fig. 34.
1886. Lispognathus — Miers, Challenger Brachyura, p. 28, Pl. V, fig. 2.
— — — S. I. Smith, Rep. Comm. Fish and Fisher. f. 1885, p. 18, Pl. I, figs. 1—1 a.
! 1900. — — A. M.-Edwards & E. L. Bouvier, Exped. Scient. du Travailleur et du Talisman, Crust. Dec., I, p. 146, Pl. III, figs. 8, Pl. XXI, fig. 8—14.

Occurrence. The "Ingolf" has taken this species at the following 10 stations.

West of Iceland:	St. 97:	65° 28′ N. L.,	27° 39′ W. L.,	450 fm.,	temp. 5·5°;	4 spec.
— - —	- 90:	64° 45′ —	29° 06′ —	568 —	— 4·4°;	2 —
— - —	- 89:	64° 45′ —	27° 20′ —	310 —	— 8·4°;	1 —
— - —	- 9:	64° 18′ —	27° 00′ —	295 —	— 5·8°;	2 —
South-West of Iceland:	- 81:	61° 44′ —	27° 00′ —	485 —	— 6·1°;	12 —
— - —	- 84:	62° 58′ —	25° 24′ —	633 —	— 4·8°;	3 —
— - —	- 73:	62° 58′ —	23° 28′ —	486 —	— 5·5°;	14 —
South of Iceland:	- 7:	63° 13′ —	15° 41′ —	600 —	— 4·5°;	1 —
— - —	- 54:	63° 08′ —	15° 40′ —	691 —	— 3·9°;	2 —
— - —	- 57:	63° 37′ —	13° 02′ —	350 —	— 3·4°;	2 —

It has also been taken at: 64° 42′ N. L., 27° 43′ W. L., 426 fm., temp. 6°, 2 spec. (Wandel); 62° 57′ N. L., 19° 58′ W. L., ca. 500 fm., "Thor" 1903.

Distribution. All the localities of the "Ingolf", Wandel and "Thor" lie west and south of Iceland; the depth is between 265 and 691 fm., the temperature from 3·4° to 8·4°. The species was originally taken in the warm area in the Færoe Channel (Wyv. Thomson), later S. W. of Ireland, 250 fm. (Pocock), in the Gulf of Gascogne, 346—750 fm. (Caullery), also in the Atlantic from the Bay of Biscay, Portugal, Morocco, the Azores, the Canary and Cape Verde Islands in 120 to 1106 fm. (A. M.-Edw. & Bouvier); in the Mediterranean at the level of Marseilles (A. M.-Edwards) and a number of places in the Adriatic

in 330—670 fm. (Adensamer). It has been taken off the east coast of America at a little below 40° N. L., 225—318 fm. (Smith), if Smith's determination is correct; A. M.-Edwards & E. L. Bouvier (op. cit. p. 151) namely considered a form taken by the "Blake" at Grenada as belonging to an independent species, *L. furcillatus* A. M.-E., and the specimens mentioned by Smith belong to *L. furcillatus* A. M.-E., so that the question arises whether *L. furcillatus* is only a variety or an independent species. In the "Challenger" *L. Thomsoni* is given from the Agulhas Bank, South Africa, 35° 4′ S. L., 18° 37′ E. L., 150 fm. Doflein states that it has been taken several times in the waters off Cape Colony in so small depths, as 56, 82 and 168 fm., further in the Indian Ocean at St. Paul, Sumatra and East Africa in depths from 357 to 459 fm. Miers did not venture to separate a specimen taken near Sydney in 410 fm. as specifically distinct from *L. Thomsoni*, but this statement of its occurrence at New Holland requires further confirmation.

If it should be confirmed by the investigations of a Zoologist who is an excellent judge of species that the determinations from all the localities mentioned are correct, this species must have an extremely wide distribution. It occurs as a rule in depths between ca. 250 and 700 fm., though met with at a little less than 60 fm. and down to ca. 1130 fm.

3. **Scyramathia Carpenteri** Norm.

1873. Amathia Carpenteri Norman, in Wyv. Thomson, The Depths of the Sea, p. 175, fig. 35.
! 1885. Scyramathia — G. O. Sars, Norske Nordhavs Exped., Crust. I, p. 6, Pl. I, figs. 1—7.
1894. — — A. M.-Edwards & Bouvier, Rés. des Camp. sc. de l'Hirondelle, fasc. VII, p. 13.
! 1900. — — A. M.-Edwards & Bouvier, Exped. Scient. du Travailleur et du Talisman, Crust. Dec., I, p. 133, Pl. XX, figs. 1—10.

Occurrence. The species has not been taken by the "Ingolf", but by later expeditions:
South of Iceland: 62° 57′ N. L., 19° 58′ W. L., 500 fm., ("Thor" 1903); 1 spec.
South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 500 fm., ("Thor" 1904); 2 spec.
— - — 61° 7′ — 9° 33′ — 425—460 fm., ("Michael Sars" 1902); 1 spec.
— - — 61° 08′ — 9° 28′ — 450 fm., ("Thor" 1903); 1 spec.
— - — 59° 28′ — 8° 1′ — 580—687 fm., ("Michael Sars" 1902); 8 spec.

Distribution. This species was originally taken on the so-called "Holtenia ground" in the warm part of the Færoe Channel (Wyv. Thomson). Later it was taken between Norway and the Shetlands at 61° 41′ N. L., 3° 19′ E. L., 220 fm. (G. O. Sars); S. W. of Ireland in 110—250 fm. (Pocock); the Gulf of Gascogne in 345 and 511 fm. (Caullery); at the Azores in 450 to 620 fm. (A. M.-Edwards & Bouvier); at various places along the south-west coast of Europe and the north-west coast of Africa, from the Gulf of Gascogne to the Canary Isles and even more southerly to 25° 39′ N. L., 18° 22′ E. L., in depths from 186 to 724 fm. (A. M.-Edwards & Bouvier).

4. **Chionoecetes Opilio** O. Fabr.

1780. Cancer Phalangium O. Fabricius, Fauna Groenlandica, no. 214, p. 234.
1788. — Opilio O. Fabricius, Nye Saml. af Kgl. D. Vid. Selsk. Skr., 3. Deel, p. 181, med 1 Tavle.

1838. Chionoecetes Opilio Krøyer, Nat. Tidsskr., B. II, p. 249.
1849. — — — Voy. en Scand. etc., Crust. Pl. I.
1856. Peloplastus Pallasii Gerstaecker, Arch. f. Naturgesch., 22. Jahrg., B. I, p. 105, Pl. I, fig. 1.
1893. Chionoecetes Opilio M. Rathbun, Proc. U.S. Nat. Mus. Vol. XVI, p. 74, Pl. IV, figs. 5—7 (gives the synonymy, but incompletely).
1894. — — A. M.-Edwards & Bouvier, Res. des Camp. sc. de l'Hirondelle, fasc. VII, p. 16.

Occurrence. This species has been taken by the "Ingolf" at the following locality.

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 1 spec.

In Malac. Groenl. (p. 28) I have enumerated some localities on the west coast of Greenland; since then I have seen specimens from Ritenbenk, Jakobshavn, Godhavn, Akudlek 30—60 fm. and Holsteenborg. A summary of our knowledge of its occurrence at West Greenland would read: it is known between 66° 56′ N. L. and 70° 42′ N. L. from the beach to 350 fm. (the last-mentioned depth, which is very unusual, according to information from Dr. Forsstrand).

Distribution. This species hat not been found east of Cape Farewell. It is thus not known from East Greenland nor from the seas north of Europe and Asia; it is only on the north-eastern part of Asia near Behring Straits that it begins at ca. 173° 24′ W. L. (Stuxberg). Off the east coast of America it is common at Newfoundland (A. M.-Edw. & Bouvier) and goes down to Nova Scotia and further to Casco Bay, Maine (S. I. Smith). Miss M. Rathbun gives a large number of localities for it from the waters on the north-western part of North America and summarises its occurrence there as follows: "from the Arctic coast of Alaska southward through Bering Strait and along the eastern and western shores of Bering Sea to the Aleutian Islands, where it is found in abundance, and thence eastward and southward along the Alaskan coast to British Columbia". Further: "It ranges in depth from shallow water to 206 fathoms on the Atlantic coast and 121 fathoms on the Pacific."

It may not be useless to point out distinctly here, that when A. M.-Edwards & Bouvier (l. c. p. 17) begin a summary of the distribution of this species with "Cette espèce n'est pas rare dans les mers froides de l'Europe...", this statement is quite incorrect.

Remarks. The largest specimen I have seen is from Jakobshavn; the carapace is 138·5 mm. long and 141·5 mm. broad, the second leg from the margin of the carapace to the tip 338 mm.

5. Hyas araneus L.

1758. Cancer araneus Linné, Syst. Nat. Ed. X, I, p. 628.
1780. — — O. Fabricius, Fauna Groenl. n. 213, p. 233.
1838. Hyas araneus Krøyer, Kgl. D. Vid. Selsk. naturv. math. Afh. Syvende Deel, p. 314.
! 1851. — — Brandt, Krebse, in Middendorffs Sibir. Reise, B. II, 1, p. 79—80.
! — — — coarctatus Hoek, Crust. "Willem Barents", Nied. Arch. f. Zool. Supplb. I, p. 3, Taf. I, Fig. 1.

Occurrence. The "Ingolf" has taken this species at the following localities.

Baffins Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 1 spec.

Davis Straits: Holsteenborg Havn, in fishing net; 1 spec.

— St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 1 spec.

Davis Straits: St. 29: 65° 34′ N. L., 54° 31′ W. L., 68 fm., temp. 0·2°; 1 spec.

Dyre Fjord, Iceland; many spec.

North-West of Iceland: St. 129: 66° 35′ N. L., 23° 47′ W. L., 117 fm., temp. 6·5°; 1 spec.

North of Iceland: St. 127: 66° 33′ N. L., 20° 05′ W. L., 44 fm., temp. 5·6°; 1 spec.

Reykjavik, in the harbour; 3 large spec.

North-West of the Færoes: St. 1: 62° 30′ N. L., 8° 21′ W. L., 132 fm., temp. 7·2°; 1 spec.

In Malacostr. Groenl. (p. 30) I have brought together a number of localities from the west coast of Greenland, and the most northerly of these is Godhavn, at 69¼° N. L., the most southerly is Godthaab, at 64° 11′ N. L.; the species was taken in 5 to 100 fm. Later investigations have not brought any new data of interest so far as West Greenland is concerned; at East Greenland and Jan Mayen it has not been found. I have seen a large number of specimens from numerous places on the western, northern, eastern and south-eastern coasts of Iceland; the species is there extremely common, as a rule at ca. 5 to 40 fm.; it is likewise common at the Færoes.

Distribution. From the Færoes the species extends southwards to the Shetlands (Norman) and the coasts of Scotland, England and Ireland (Bell, Walker, etc.); it does not seem to have been observed on the west coast of France, but on the other hand it occurs at the Channel Islands (Koehler) and as it is given by H. Milne-Edwards from France it must certainly occur on its north coast; further at Belgium (v. Beneden), Heligoland and several other places in the southern half of the North Sea (Metzger, Meinert), in the Kattegat and northern part of the Sound (Meinert), along the coasts of Norway (M. Sars), at Bear Island and Spitzbergen (G. O. Sars, Doflein, Birula), in the White Sea, along the whole north coast of Europe, in the northern part of the Murman Sea (Knipowitsch); at the eastern end of Jugor Schar (Hansen), at the east coast of Nova Zembla (Stuxberg) and even in the Kara Sea at ca. 60° E. L. Beyond the last-named locality and along the north coast of Asia as far as 177° 41′ E. L., that is, a distance of over 100 degrees of longitude, it is not known. On the other hand it occurs along the most easterly part of the north coast of Asia from 177⅔° E. L. to East Cape (Stuxberg)[1] and in the Sea of Ochotsk (Brandt); but again it is not known from the north-west coast of America. On the north-eastern side of America it has been taken at Labrador, Newfoundland, Gulf of St. Lawrence, Nova Scotia and in the Gulf of Maine south to Cape Cod (Smith, M. Rathbun), and the greatest known depth here is 137 fm., while at Spitzbergen it has been taken once in nearly 170 fm.

The species is not known from East Greenland or Jan Mayen; nor according to the above account is it known from the 100 degrees of longitude along the north coast of Asia nor from the northern or western coasts of America. Much is wanting therefore to prove it circumpolar; it may be so but there is just as much probability at least for its not being so. The fact, that it has not been taken north of 69¼° N. L. at West Greenland, is not known from arctic America north or north-west of Labrador, nor from East Greenland, is rare in the Kara Sea, while on the other side it goes down to the Channel, shows that the species is not typically arctic but that in its occurrence it has just as much the appearance of being boreal as arctic.

Of its bathymetric distribution may be said, that it occurs as a rule in depths of 15 to 70 fm.,

[1] In 1907 A. Birula casts doubt on Stuxberg's determination of the specimens from these localities.

but that it is sometimes met with in quite shallow water, while nearly 170 fm. is the greatest depth I have found ascribed to it.

Remarks. The largest specimens I have seen were taken in Breidals Vig on the east coast of Iceland in 9—14 fm. (A. C. Johansen). The largest of these is a male which has the following dimensions: length of cephalothorax 110 mm., breadth of this 86 mm., length of the first pair of legs 152 mm., distance between the tips of the second pair of legs 392 mm.

6. **Hyas coarctatus** Leach.

1815. Hyas coarctatus Leach, Transact. Linn. Soc. Lond., Vol. XI, p. 329.
? — — Cuvier, Le Règne animal, Edit. acc. de Planches grav., Pl. 32, fig. 3.
! 1851. — — Brandt, Krebse, in Middendorffs Sibir. Rejse, B. II, 1, p. 81.
1893. — — M. Rathbun, Proc. U. S. Nat. Mus., Vol. XVI, p. 69.

Occurrence. This species has been taken by the "Ingolf" at the following stations.

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 9 spec.
— - 34: 65° 17′ — 54° 17′ — 55 — — ? ; 3 —
— - 26: 63° 57′ — 52° 41′ — 34 — — 0·6°; 1 —
— Mouth of Ameralik Fjord by Godthaab, 5—70 fm., 1 —
West of Iceland: St. 98: 65° 38′ N. L., 26° 27′ W. L., 138 fm., temp. 5·9°; 1 spec.
North-West of Iceland: St. 129: 66° 35′ N. L., 23° 47′ W. L., 117 fm., temp. 6·5°; 3 spec.
North of Iceland: St. 127: 66° 33′ N. L., 20° 5′ W. L., 44 fm., temp. 5·6°; 7 spec.
West of Iceland in Brede Fjord: St. 87; 65° 2′ N. L., 23° 56′ W. L., 110 fm., temp. ?; 36 spec.
— — - 86: 65° 4′ — 23° 48′ — 76 — — ?; 9 —
South South-East of Iceland: St. 6: 63° 43′ N. L., 14° 34′ W. L., 90 fm., temp. 7; 4 spec.

In Malac. Groenl. I have mentioned a number of localities for this species between 70° 25′ N. L. and 60° 43′ N. L. along the west coast of Greenland, depths from 5 to 100 fm.; later discoveries have not extended our knowledge. It has also been taken on all four coasts of Iceland at numerous localities; it is common at the Færoes and it has twice been taken in 150 fm. It has not been found at East Greenland or Jan Mayen.

Distribution. From the Færoes it extends southwards over the Shetlands and the Hebrides to the east and west coasts of Scotland and England (Norman, etc.); it has been taken on the south coast of England (Bell), in the Irish Sea (Walker), S. W. of Ireland in 250 fm. (Pocock), at the Channel Islands in 10—20 meters (Koehler) and at Roscoff on the north coast of France (Delage); also at Belgium (v. Beneden), eastern part of the North Sea and Skager Rak (Metzger), Kattegat and northern part of the Sound (Meinert), from the last-named northwards along the whole of the west coast of Scandinavia and at East Finmark (M. Sars), Magdalene Bay on the west side of Spitzbergen (G. O. Sars) and along the north coast of Europe in the Murman Sea to 49° E. L. (Birula), but not in the White Sea (Birula); further east, it is not known with certainty and neither on the west or east coast of Nova Zembla nor in the Kara Sea. (I think that Stuxberg's statement in 1886 of its occurrence in the Kara Sea is incorrect, undoubtedly due to the example of Hoek (see synonymy list to *H. araneus*), as Stuxberg in

his first work of 1882 had also stated that it was *H. araneus* which occurred in the Kara Sea and he does not mention *H. coarctatus* at that place). It is also very common in Bering Straits to 71° 02′ N. L. (M. Rathbun); on the east coast of Asia it has been taken at East Cape and Plover Bay (M. Rathbun), on the Corean coast at 37° 2′ N. L., 129° 31′ E. L. (Suenson, in Copenhagen Museum), and a small specimen in the Copenhagen Museum is stated by the collector (Capt. Suenson) to have been taken 15 miles off Amoy, but this locality which lies at 24½° N. L. seems to me for this reason uncertain and perhaps comes from some error. Lastly, on the east coast of America, it has been taken at Labrador, Newfoundland, Gulf of St. Lawrence, Nova Scotia, along the coast of the United States to New Yersey at ca. 40° N. L.; and somewhat out from the coast even to 36° 41′ N. L., 74° 39′ W. L. (M. Rathbun and S. I. Smith).

The literature contains a very large number of single notices as to the depths at which this species has been taken, and the great majority of these give between 10 and 100 fm., seldom 5 to 10 fm. and sometimes 100—200 fm. I have found only three statements of greater depths, namely, S. W. of Ireland in 250 fm. (Pocock), 36° 41′ N. L., 74° 39′ W. L. in 373 fm. (Smith, 1884) and 41° 13′ N. L., 66° 1′ W. L. in 906 fm. (Smith, 1884). All these and especially the last are extremely surprising, as the species thus appears to be a true deep-sea form in the Atlantic, but it should be remarked that there is also a further remarkable anomaly, namely, that a little further south at four stations from 41° 10′ N. L. to 40° 20′ N. off the east coast of America it has been taken in depths of only 41 to 62 fm. S. I. Smith is so trustworthy an observer that we cannot doubt his determinations, but so long as there is only this one notice one is inclined until further information is forthcoming to fear greatly that it has arisen through some error or another.

According to this distribution, *Hyas coarctatus* is essentially a boreal form, which extends to a certain extent into arctic waters but is absent at such purely arctic localities as East Greenland (north of 66° N. B. at least), Jan Mayen, East Spitzbergen and the Kara Sea. It is thus more typically boreal than *H. araneus,* which is also in agreement with the fact that on the east coast of North America it goes much further south than the latter and considerably to the south of Cape Cod; sometimes it goes down into greater depths than *H. araneus.* It is very probably not circumpolar; that its circumpolarity is far from being proved needs scarcely be stated. That the "Fauna Arctica" here as so often is defective and misleading may likewise just be mentioned.

Remarks. *H. coarctatus* is much smaller than the previous species. The largest specimen is a male from West Greenland, locality unknown; the carapace is 99 mm. long, 74 mm. broad, the first pair of legs 156 mm. from the lateral margin of the carapace to the tip (on the underside 171 mm. to the sternum), the second leg 174 mm. from the lateral margin of the carapace to the tip.

7. **Portunus holsatus** Fabr.

1798. Portunus holsatus J. C. Fabricius, Suppl. Entom. Syst., p. 366.
1844. — — Bell, Brit. Crustacea, p. 109, with fig.
1861. — — A. Milne-Edwards, Archives du Museum, T. X, 1, p. 393.
! 1863. — — Heller, Crust. südl. Europa, p. 85.

Occurrence. The "Ingolf" has not taken this species, but it is to hand from other sources.

West coast of Iceland: Reykjavik, 1 specimen (taken by Hallgrimsson), and it has been secured a number of times at the Vestmanna Islands and from there eastwards along the south coast of Iceland to ca. 15½° W. L. in depths from 10 to ca. 60 fm. (A. C. Johansen, "Thor" 1903 and 1904, and "Beskytteren"). At the Færoes it has hitherto been taken only three times, namely, in Kalbaks Fjord, 16—40 fm. (Th. Mortensen); 4 miles east from Naalsø, 80 fm. (Th. Mortensen), and 61° 56′ N. L., 7° 04′ W. L., 30 fm. ("Thor" 1903).

Distribution. This species is known from the Shetlands and the Hebrides (Norman), further south from the east and west coasts of England and east coasts of Ireland (various authors), north and west coasts of France (Bonnier). It is said also to have been taken in the Mediterranean (Costa, test. Heller) and in the Black Sea (Czerniavsky, test. Ortmann). To this it may be added, that Heller wrote concerning *P. marmoreus* Leach: "ist vielleicht bloss eine Varietät" of *P. holsatus*; A. Milne-Edwards & E. L. Bouvier wrote in 1899: "Si, comme il y a lieu de le croire, le *P. marmoreus* doit être identifié avec le *P. holsatus* Fabricius", and they show that *P. marmoreus* is taken at the Azores and state that it "habite depuis le voisinage du littoral jusqu'à 60 m.—100 m. profondeur". I am unable to settle the question whether *P. marmoreus* Leach is only a variety of *P. holsatus* Fabr., but mention the statements cited so as to show so far as possible the present state of our knowledge, with special regard to the distribution of this species to the south.

P. holsatus has also been taken at the coasts of Belgium (v. Beneden), Holland (Herklots, test. Ortmann), off and at the west coast of Jutland (Meinert, Metzger), in the Skager Rak and "northern part of the Kattegat as far as Varberg" (Meinert), at the south coast of Norway (G. O. Sars), lastly Vesteraalen in Lofoten (Nordgaard). The greatest depth I have found given is 70 fm., stated by Meinert (1890).

The most northerly place from which the species was formerly taken was the Shetland Isles, between 60 and 61° N. L.; the statements given above of its occurrence not only at the Færoes but also at the southern coast and the south part of the western coast of Iceland to ca. 64° 10′ N. L. mean a not unimportant increase to its distribution, and we have at the same time a new example of how southern forms reach up to these places at Iceland.

Remarks. The largest of the above-mentioned specimens came from the south coast of Iceland; its carapace is 34 mm. long and 44½ mm. broad, which shows that it is indeed adult but not a specially large specimen, as A. Milne-Edwards (1861) gives respectively 40 and 53 mm. as the two dimensions of the carapace.

8. Carcinus Mænas L.

1758. Cancer Maenas Linné, Syst. Naturæ, Ed. X, p. 627.
1844. Carcinus — Bell, Brit. Crust., p. 76, with fig.
! 1861. — — A. Milne-Edwards, Archives du Museum, T. X, p. 391.
1866. — — Heller, Crust. südl. Europa, p. 91, Taf. II, Fig. 14, 15.

Occurrence. This species, which was not taken by the "Ingolf", is present from the following localities.

West coast of Iceland: Reykjavik, the shore at ebb-tide; 4 spec. (A. C. Johansen).

— - — 2 miles S. E. of Reykjavik, 6 fm., sand and stone; 2 very large spec. (A. C. Johansen).

South of Iceland: Vestmanna Islands, in sandeel-net; 1 spec. (A. C. Johansen).

Færoes: two old specimens identified by Krøyer (taken by Nees).

— Aadna Fjord, 0—15 fm., (R. Hørring).

— Head of Trangisvaag Fjord, 0—1 fm.; 1 good-sized spec. (Otterstrøm).

Distribution. The species is known from the Shetlands and Norman writes that it is "remarkably large" there. A. Milne-Edwards writes in his Monograph (l. c., p. 392): "Cette espèce vit en grand nombre sur les côtes de France et d'Angleterre. On la rencontre sur tout le littoral de la Méditerranée, peut-être même jusque dans la mer Rouge. Les Carcins Ménades se trouvent sur les côtes des Etats-Unis d'Amerique. Au nord, ils remontent jusqu'à la mer Glaciale". The last two statements however require correction, but I have thought it right to cite what stands in the Monograph. According to Gourret's "Tableaux comparatifs" (p. 44) the species is also found in the Black Sea, at the coast of Portugal and at the Canary Isles, but I do not know the sources from which he takes these data, of which especially the last is of interest. On the east coast of North America the species according to Smith and M. Rathbun is distributed from ca. $43^2/_3°$ N. L. to $39^1/_2°$ N. L. It occurs on all coasts of the North Sea, goes through the Sound and the Belts into the western Baltic (Meinert, Møbius); on the west coast of Norway it goes to the North Cape (M. Sars, Appellöf), but statements on its occurrence at East Finmark and in the Murman Sea seem to be erroneous (Appellöf).

Kingsley (1878) writes: "This species is almost cosmopolitan in its range. It is found on the Eastern Coast of the U. S., from Cape Cod to New Jersey (in 1879 he gives a still more southerly locality, namely, Northampton Co. in Virginia), at Panama, in the Hawaiian Islands, France and England, in the Baltic and Mediterranean, the Red Sea, Brazil, and, doubtfully, in Australia". In his work on the Indian Crustacea Alcock states that he has seen a specimen from Ceylon; in 1902 it is noted from Port Phillip, Victoria (teste Calman).

This distribution of a coastal form such as *Carcinus Mænas* is extremely interesting; we know indeed some few species of crabs and Stomatopoda which have just as great a distribution in the tropical belts, but none that go so far north.

Remarks. In the largest of the above-mentioned specimens from Iceland the carapace is 79 mm. broad and 62 mm. long; the distance between the tips of the second pair of legs is 234 mm.

9. **Geryon affinis** A. M.-Edw. & Bouv.

Pl. I, figs. 1 a—1 b.

1894. Geryon affinis A. Milne-Edwards & E. L. Bouvier, Rés. des Camp. sc. de l'Hirondelle, fasc. VII, p. 41, Pl. I, fig. 1.

1904. — — F. Doflein, Brachyura, in Wiss. Ergebn. Deutschen Tiefsee-Exp., B. 6, p. 106, Taf. III, IV, XXXIII, XXXIV, Taf. XXXVIII, Fig. 1—6, Taf. XLI, Fig. 3—7, Taf. XLIII, Fig. 2 & 8.

Occurrence. The "Ingolf" took this species at the following two stations.

S. of Iceland: St. 67: 61° 30′ N. L., 22° 30′ W. L., 975 fm., temp. 3°; 1 female.

— — - 65: 61° 33′ — 19° 0′ — 1089 — — 3°; 1 male.

Distribution. This species was first taken by the Prince of Monaco at ten stations near the Azores and in depths from 330 to 733 fm. These islands lie between 37° and a little below 40° N. L.; the occurrence of *G. affinis* at 61½° N. L. and at much greater depths as indicated above has therefore considerable interest. Further, it has been taken in the South Atlantic at ca. 25½ S. L. in a vertical net at 1064 fm. and 498 fm. (Doflein), at the coast of East Africa a little below 3° N. L. in 724 fm. (Doflein) and in the Indian Ocean off the Travancore coast (Alcock).

Remarks. A. Milne-Edwards and Bouvier have given a detailed and careful description of this species and remarked on the differences between it and the nearly allied *G. quinquedens* Smith. The "Ingolf" specimens certainly belong to *G. affinis,* which is evident amongst other things from the form of the last joint of the walking legs, a character specially noted by the French authors with good reason. These authors have only figured an extremely large specimen; my specimens are rather small, the carapace in the male being only 40 mm., in the female 42 mm. in length, and I have thought it useful to give the outline of the carapace of both specimens so as to show the variation in form and number of processes between these two specimens and between these and the specimen figured by M.-Edwards & Bouvier.

The female bears thousands of very small eggs, the diameter of which is 0·5—0·6 mm. The Zoëæ of a number of eggs were just breaking out or had just broken out. This is of interest as it shows that there is here a normal swimming stage in this deep-water form.

10. Geryon tridens Kr.

! 1837. Geryon tridens Krøyer, Naturh. Tidsskr. B. I, p. 10, Tab. 1.

1881. — longipes A. Milne-Edwards, Compt. Rend. Acad. Sc. Paris, T. XCIII, p. 879 (teste A. M.-Edw. & Bouvier).

! 1900. — — A. Milne-Edwards & E. L. Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 103, Pl. II, Pl. XVII, figs. 13—21.

1903. — — Senna, Bull. d. Soc. Entom. Ital., Anno XXXIV, 1902, p. 354.

Occurrence. Between the Færoes and Scotland: 59° 28′ N. L., 8° 1′ W. L., 687—580 fm.; 1 spec. (12/8 1902, "Michael Sars").

Distribution. The species was originally founded on a specimen from the south-eastern part of the Kattegat; later, it has been taken in the Skager Rak near the Skaw (Joh. Petersen). In Norway it is not rare in the inner part of Christiania Fjord and has also been taken in one of the fjords at Bergen (G. O. Sars). It is noted from 48° 31′ N. L., 10° 3′ W. L., 690 fm. (Norman), near Valentia, Ireland, in dredging from "85 to 808 fathoms", lastly from 59° 37′ N. L., 7° 19′ W. L., 530 fm., temp. 8°. As *G. longipes* has been included as a synonym, the distribution of the species is extended to the following regions: Gulf of Gascogne, at a number of localities with depths from 346 to 617 fm. (Caullery, A. Milne-Edwards & Bouvier), the western Mediterranean near the south coast of France, at Sardinia,

Naples, between Stromboli and Messina, the Adriatic, from 266—372 fm. to 800 fm. (several authors). — We may summarise the data on its bathymetric distribution by saying, that it occurs in depths between 250 and 800 fm.; in the Danish waters isolated specimens are met with at intervals of many years in much smaller depths, certainly even as low as between 20 and 30 fm.

Remarks. The specimen taken by the "Michael Sars" is a small female, with carapace 25 mm. long. Comparing this with a female (and a male) of the same size of *G. longipes* A. M.-Edw. from the Gulf of Gascogne, I have come to the conclusion that there is absolutely no difference between the specimens; then I compared all three with a specimen of *G. tridens* Kr. from Norway: a male with carapace 53 mm. long, and found that the differences noted by Milne-Edwards & Bouvier between *G. tridens* and *G. longipes* do not hold good. Senna came to a somewhat similar result, but the differences in the mouth-parts mentioned by him are also not maintainable and quite worthless as specific characters. I consider it quite certain that *G. longipes* A. M.-Edw. is only a synonym of the old species of Krøyer.

11. **Cymonomus Normani** Lankester.

Pl. I, figs. 2 a—2 i.

1904. Cymonomus Normani E. Ray Lankester, Quart. Journ. Micr. Sc. Vol. 47, New. Ser. p. 456, Pl. 33, fig. 1, Pl. 34, figs. 8, 10, 11.

Occurrence. There is only one specimen from the "Ingolf" expedition, but later the "Thor" has twice taken this remarkable form.

South-West of Iceland: St. 73: 62° 58′ N. L., 23° 28′ W. L., 486 fm., temp. 5·5°; 1 spec.

South of Iceland: 62° 57′ N. L., 19° 58′ W. L., 509 fm., "Thor" 14. VII. 1903; 1 spec.

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 516 fm., "Thor" 22. V. 1904; 1 spec.

Distribution. The species was only known previously from two places south-west of the last-named locality, namely, in the warm area south of the "Wyville Thomson Ridge" at ca. 59½° N. L. in 542 and 705 fm.

Remarks. The species has been described and richly illustrated in the paper mentioned of Lankester. Before this was prepared I had drawn some figures of the single and very defective specimen of the "Ingolf"; a copy, in outline, of one of these figures is introduced in Lankester's paper (fig. 12 on p. 459) with some remarks. I have thought it of no use to give a detailed description of the species, as the differences between it and the *C. granulatus* Norm. fully described by A. Milne-Edwards & E. L. Bouvier have been indicated by Lankester. I have however drawn the anterior margin of the carapace and the eye-stalks of all my three specimens in order to show, that there is some variation between them in the reduction of the rostrum, in the form of the eye-stalks and in the size of the lateral corner-processes. In all my specimens the eye-stalks diverge a little from one another at the anterior margin of the head — they are not, as Lankester states, "immovably united to the margin of the carapace", as the anterior margin of the carapace is quite free above the skeleton of the head; figs. 10 and 11 on Pl. 34 of Lankester's paper likewise show that there is some distance between the roots of the two eye-stalks, and fig. 8 (Pl. 34) must undoubtedly be incorrect in

this regard. My figures show the slight variation in the curvature, thickness etc. of the eye-stalks, which are all of course without any trace of a cornea; they further show the granular structure correctly, as I have given the granulæ according to the right number and relative size. The differences in these regards between Lankester's figures and mine I ascribe unhesitatively to imperfections in the former, as there is not the least doubt that Lankester's specimens of *C. Normani* and mine belong to the same species. On the other hand, Doflein is quite wrong in considering *C. Normani* a sub-species of *C. granulatus*.

B. Anomura.

12. **Neolithodes Grimaldii** A. M.-Edw. & Bouv.

! 1894. Lithodes Grimaldii A. Milne-Edwards & E. L. Bouvier, Rés. Campagnes sc. l'Hirondelle, fasc. VII, p. 62, Pl. III, figs. 1—6.

1894. — Goodei Benedict, Proc. U. S. Nat. Museum, Vol. XVII, p. 479.

1896. Neolithodes Grimaldii Bouvier, Ann. Sc. Nat., Zool., Sér. 8, T. I, p. 22 (with complete synonymy).

Occurrence. The "Ingolf" has taken this species at 3 stations.

Davis Straits: St. 25: 63° 30′ N. L., 54° 25′ W. L., 582 fm., temp. 3·3°; 1 gigantic specimen.

South of West Iceland: St. 68: 62° 06′ N. L., 22° 30′ W. L., 843 fm., temp. 3·4°; 1 very small spec.

— - — - 40: 62° 00′ — 21° 36′ — 845 — — 3·3°; 1 — — —

Distribution. The type specimens of the French authors were taken near Newfoundland in 674 fm. The species has several times been found off the east coast of America, but being confused by Smith with *L. Agassizii* I am unable to see everywhere which species he had from any given locality, and will therefore restrict myself to saying, that it was taken at any rate at 39½° N. L., 41½° N. L. and at intermediate places off the east coast mentioned in depths from 410 to 1230 fm.

Remarks. In the largest specimen from St. 25 the carapace, excluding the spine- or process-like rostrum, is 104 mm. long and 91 mm. broad; the fourth thoracic leg 308 mm. from the base of the coxa to the tip. The spines on the thorax must have been for the most part extremely long, but the long ones are all broken; the longest fragment is however 26 mm.; the number and position of the spines agree with the figures in the literature by S. I. Smith and A. Milne-Edwards & E. L. Bouvier, but it should be remarked that there are several short, conical tubercles or small processes more or less close to the margin of the carapace and on the upper surface some low tubercles which must be regarded as rudimentary spines. — In the two small specimens the carapace is respectively ca. 7 and 8 mm., apart from the long process of the rostrum; they are typically developed specimens of *N. Grimaldii,* but it should be remarked that in the larger specimen, the carapace has some fairly short to quite short spines chiefly on its posterior half between the long spines and at the margin (almost as Smith's fig. 2 in Rep. U. S. Comm. Fish and Fisheries for 1885, Pl. III), while in the smaller specimen only the posterior margin and a small part of the lateral margin of the carapace — but not the upper surface — have some short spines between the long.

13. Lithodes Maja L.

1758. Cancer Maja Linné, Systema Naturæ, Ed. X, I, p. 629.
! 1853. Lithodes Maja Bell, Brit. Stalk-eyed Crust. p. 165, with fig.
! 1894. — arctica E. L. Bouvier, Ann. Sc. Nat., Zool., Sér. 7, T. XVIII, p. 181, Pl. X, fig. 7, Pl. XII, figs. 5a—5b.
1896. — Maja E. L. Bouvier, Ann. Sc. Nat., Zool., Sér. 8, T. I, p. 24.

Occurrence. The "Ingolf" has not brought home this species, but it is to hand from several other sources.

Davis Straits: 65° 30′ N. L., 55° 26′ W. L., 289 fm., sand and stones, Wandel 1889; 1 spec.

Denmark Straits: off Angmagsalik, at ca. 65° N. L., 140 fm., stones, 2nd Amdrup Exp. 1900; 1 spec.

South of Iceland: Vestmanna Islands, District-physician Thorstein Jönsson; 1 large spec.

Færoes: Agent Müller; 1 spec.

Distribution. The species extends from the Shetlands (Norman) and the Orkneys (Bell) southwards, on the west side of Great Britain to the Isle of Man (Bell), in the North Sea to the coasts of Belgium (v. Beneden) and Holland (Hoek). At Denmark it is only found in the more northerly half of the Sound and has been noted by the fishermen from Anholt (Meinert); it is also known from Bohuslän (Goës), along the Norwegian coast to Vadsø at Varanger Fjord (M. Sars), lastly on the most western part of the south coast of the Murman Sea, but not in the White Sea (Birula). A single specimen is recorded from 74° 25′ N. L., 17° 36′ E. L., nearly 100 fm. (Hartlaub, teste Birula); another from West Spitzbergen (Doflein). On the east coast of America it has been taken at Nova Scotia, in the Gulf of Maine and southward to 40° 3′ N. L. (S. I. Smith); the depths are given as "52 to 90" and down to 291 fm. — The species is thus boreal and not arctic (as Doflein states); it has not been taken at any place with temperature below zero.

14. Paralomis spectabilis n. sp.

Pl. I, figs 3a—3d; Pl. II, figs. 1a—1b.

Occurrence. The "Ingolf" has taken this large new species at four stations.

Between South Greenland and Iceland: St. 92: 64° 44′ N. L., 32° 52′ W. L., 976 fm., temp. 1·4°; 2 small spec.

— — - — - 95: 65° 14′ — 30° 39′ — 752 — — 2·1°; 1 good-sized ♂.

— — - — - 96: 65° 24′ — 29° 00′ — 735 — — 1·2°; 2 — ♂ and ♀.

South of Iceland: St. 64: 62° 06′ N. L., 19° 00′ W. L., 1041 fm., temp. 3·1°; 1 small ♂.

Description. In appearance this species shows considerable resemblance to *Neolithodes Agassizii* Smith as figured in Bull. Mus. Comp. Zool. Vol. X, Pl. I, but it is easily distinguished by the development of the antennal squama and the abdomen. Within the genus *Paralomis* the new species belongs to the division which lacks the protuberance on the under side of the rostrum (see Bouvier's classification).

The carapace, excluding the rostrum, is almost as long as broad; its posterior margin is considerably incised in the centre, and an obvious curve is seen on each lateral margin at a distance from the anterior corner of a little less than one-third of its length; the carapace is further provided with ca. 30 long to fairly long spines (including the marginal spines), some smaller spines and numerous

small tubercles. The rostrum is short and has the usual three smooth processes, the form and direction of which offer nothing of interest. The gastric area is greatly arched, marked posteriorly by a deep cervical furrow from the cardiac area; on the gastric area are 7 very apparent spines, namely, one unpaired long and strong spine in front of the central portion and 3 pairs somewhat shorter but yet good-sized spines out towards the lateral margins, and also some small spines and a number of very small tubercles. Each hepatic region has two long marginal spines, the first of which is on the anterior corner, as also some small tubercles; the considerably arched cardiac area has 4 good-sized spines. The lateral margin has 4 to 5 good-sized and several smaller spines behind the cervical furrow; along the posterior margin are 4 to 6 somewhat low and also some minute spines.

The eye-stalks touch one another at the base; they bear some small tubercles or spines on the upper side. The stalk of the antennæ reaches almost to the middle of the last joint of the peduncle of the antennula; its first joint (fig. 3 b) has a short spine on its outer anterior corner; the spine on the front corner of the second joint reaches forward in front of the middle of the squama and at its base the outer margin sometimes has a tubercle. The squama (figs. 3 b, 3 c, 3 d) has as a rule two processes on the proximal $^2/_5$-ths of its outer margin, the distal one being as a rule fairly long, much longer than the proximal which is short usually but may also at times be longer than the distal or lacking altogether; above on the inner margin, the squama has as a rule a tubercle or short spine near its base and in one of the specimens further a rather long distal spine on the left squama. The flagellum is as long as or even a little longer than the distance from the tip of the longest process of the rostrum to the posterior margin of the cephalothorax. Between the last pair of maxillipeds the sternum has two tufts of bristles but no spines.

The first leg on the right is a little longer and considerably thicker than that on the left, the chela especially is much heavier; the meropodite has a single, very long spine on the inner side at the anterior end; the carpus has a similar very long spine on the inner side and on the upper side out towards the lateral margin several fairly long and some shorter spines. The three pairs of walking legs are long with the larger spines placed in rows; the front upper margin of the carpus has 3 long and 3 short or very short spines.

The second segment of the abdomen (figs. 1 a and 1 b) has only short or even fairly short, setigerous spines and several small spines or protuberances. No row of protuberances between the median plates of the 3rd—6th segments. In the large male (fig. 1 a) the right lateral plate of the 3rd segment has a single, lateral, movable plate, the left none at all; in the small male the right lateral plate of the same segment has two movable lateral plates, the left lateral plate one; in the females (fig. 1 b), there is no movable lateral plate on the right lateral plate of either the third or fourth segment.

Measurements. The largest specimen, a female with 1st pair of legs broken off, has the following dimensions.

Length of cephalothorax to tip of longest process of rostrum	54·5	mm.
— - — - base of rostrum	45·5	—
Breadth - —	46	—
Length of second right walking leg, on under side	119	—
— - — — — — - upper —	114	—

In a second female the cephalothorax with rostrum is 48·8 mm., the 1st right leg below 69 mm., the 2rd right leg below 106 mm.

15. Paralomis Bouvieri n. sp.

Pl. II, figs. 2 a—2 f.

Occurrence. The "Ingolf" has taken this interesting form at 2 localities.

Between South Greenland and Iceland: St. 96: 65° 24′ N. L., 29° 00′ W. L., 735 fm., temp. 1·2°; 1 spec. (♂).

South of Iceland: St. 53: 63° 15′ N. L., 15° 07′ W. L., 795 fm., temp. 3·1°; 1 spec. (♀).

Description. One of the two specimens is a good-sized female with eggs, the other a somewhat small male. To judge from the general body-form, spine-equipment of cephalothorax, form and armature of rostrum, length and spination of the legs etc. it is quite certain that the two specimens belong to the same species, but they differ greatly nevertheless in the spination of the antennal squama, in the spiny equipment of the abdomen and above all in that the marginal plates on the 3rd abdominal segment are quite free in the male, but quite fused with the lateral plates in the female. As this feature in the marginal plates of the third segment is generally considered an important generic character, the male should be referred to *Acantholithus* Stimps., the female to *Paralomis;* I have preferred to place the species with the latter as it shows some resemblance to *P. aculeatus* Hend.

The carapace, excluding the rostrum, is but little longer than broad; the posterior margin in the female is obviously incised in the centre, in the male only slightly, and on each lateral margin there is a conspicuous curve at a distance of a little more than one-third of its length from the fore corner. The upper surface in the female is densely covered with spines, many of which are long, some moderate and some fairly short, but most of them are slender and end with a little tuft of bristles; in the male the spines are even slightly more numerous and the longest relatively longer than in the female, while the short are relatively shorter and less slender than in the latter. The rostrum (fig. 2 b) is short and ends with the ordinary three processes which have a small number of extremely small tubercles; there is no projection or spine on the under side, but on the upper side close behind the distal processes the rostrum has two fairly long, slender spines. The gastric area is somewhat highly arched; the cervical furrow is deep and very sharply marked between the gastric and the cardiac areas, but opposite the anterior corners of the latter it has really disappeared.

The eye-stalks (fig. 2 b) are apposed at the base; each has a pair of spines and some granulations on the upper surface, as also a fairly long, slender spine from the distal end over the black eye. The stalk of the antennæ is almost as in the previous species, but the spiny equipment of the outer margin is more developed; the outer, anterior corner of the first joint bears a spine in the female but none in the male; in both specimens a moderate spine springs from the base of the terminal long process, and behind this there is in the female another very short spine. As mentioned the squama is very different in the two specimens; in the female (fig. 2 c) it may be said to be short, fairly thick, ending with two spines, the outer of which is long and the inner very long; behind the inner above there is a fairly long spine and behind this again on the left squama a pointed tubercle. In the male the squama may be described as thorn-like, on the inner side of the right squama (fig. 2 d) there is a moderately

short spine and on the outer side a short spine near the base; the left squama (fig. 2 e) has no spine on the outer side, but two short ones on the inner side, one near the base, the other about opposite the centre. The sternum has two groups of bristles between the posterior pair of maxillipeds but no spines.

The first pair of legs in the female are almost equally long, but the carpus and hand are considerably thicker on the right leg than on the left (the right leg is wanting in the male); the spiny equipment is well-developed, a distal spine on the inner side of the meropodite and a spine on the centre of the inner side of the carpus being especially very long; the others are easily seen from the figure. The walking legs are relatively a little shorter than in the previous species; the spine-equipment is well-developed, but while some of the spines, especially the long, are in rows, others are scattered.

The second segment of the abdomen is provided with numerous spines in both sexes, but while in the female these are almost as long as on the posterior part of the carapace, they are obviously shorter in the male; the rest of the abdomen is, as already mentioned, so different in the two specimens that these must be described separately. In the male (fig. 2 f) the upper surface of the 3rd to the 7th segment is provided with many setigerous tubercles, some of which are almost like short spines; on each side of the 3rd to the 5th segments are fastened movable, marginal plates 10 in all, some of them very small but each drawn out into a spine and sometimes also provided with a tubercle; the lateral plate of the 3rd segment has on each side three of these movable, marginal plates, and there is a fourth plate between the 3rd and 4th segments. There does not seem to be any spinous tubercles between the middle plates of the segments. In the female (fig. 2 g) the upper surface of the 3rd to the 7th segments is covered by numerous, moderately long spines; the marginal plates of the 3rd segment are completely fused with the lateral plate, so that the line of junction cannot be seen; on the 4th segment the second marginal plate is completely fused with the lateral plate, while the two others are very movable and large; the marginal plates of the 5th segment are all very movable. Between the central plates of the 3rd—4th and 4th—5th segments in the female there is a cross-row of tubercles with spines but only a single tubercle of this kind between the central plates of the 5th and 6th segments.

Measurements. — Female. The length of the carapace to the tip of the longest process of the rostrum is 43·5 mm., without the rostrum 34·8 mm.; breadth of carapace 34 mm., first right leg (chela) on the upper side 61·5 mm., on the under side 66·5 mm.; the second right leg on the upper side 80 mm., on the under side 85·5 mm.

Male: Length of carapace to tip of longest process of rostrum 28·7 mm., without rostrum 23 mm.; breadth of carapace 21 mm.; the first and second legs on the right side are wanting, the third measures on the upper side 52 mm., on the under side 57 mm.

Remarks. I have called this species after Professor E. L. Bouvier, who has done such good work in connection with the Decapoda and amongst these not least with the family Lithodidæ.

16. Eupagurus Bernhardus L.

1758. Cancer Bernhardus Linné, Syst. Naturæ, Ed. X, p. 631.

! 1844. Pagurus — Bell, Brit. Crust. p. 171, with fig.

! 1896. Eupagurus Bernhardus Bouvier, Feuille d. Jeunes Natur., III Sér. 26e Ann. p. 151, fig. 21.
1900. — — A. Milne-Edwards & E. L. Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 239.
! 1901. — — Benedict, Proc. U. S. Nat. Mus., XIII, p. 452, with fig.
— — acadianus, — — — — — XIII, p. 454, — —

Occurrence. This species has only once been taken by the "Ingolf".

West side of Iceland: Dyre Fjord, in plaice-net, 2 large spec.

I have also seen specimens from several points along the west coast of Iceland, right from its northernmost part, namely Høfn Bugt, also Adelvig, Skutils Fjord, Ønundar Fjord, Brede Bugt, Faxe Fjord, Reykjavik; it has been taken on the western part of the south coast of Iceland at Grindavik, Vestmanna Islands, off Eyjafjällajökul and at 17° 34′ W. L., but not from any more easterly locality, and it has never been taken on the north or east coast of Iceland. At Iceland it has been taken on the beach at ebb-tide and from there out to ca. 60 fm. At the Færoes it is common and goes down to 100 fm.

Distribution. It occurs at the Shetlands (Norman), is common at Scotland, England and Ireland, also on the north coast of France and on its west coast in the Gulf of Gascogne (several authors). It is noted from the coast of Portugal (Capello, test. A. M.-Edw. & Bouvier); in the Mediterranean it has been taken at Marseilles (Gourret) and is noted (by Guérin, test. A. M.-Edw. & Bouvier) from Morea, but this seems to me somewhat doubtful. It is also distributed on the southern and eastern coasts of the North Sea (Metzger, etc.), through the Kattegat and somewhat into the Danish Belts (Meinert); it is known further from Kiel and Eckernförde (Möbius). It occurs on the southern and western coasts of Norway, on the west and east coasts of Finmark (M. Sars, Norman, Nordgaard) and on the coast of the short, western part to ca. 35° E. L. of the Murman Sea (Birula). On the east coast of North America the species occurs "from the Grand Bank of Newfoundland to the mouth of Chesapeake Bay, 7 to 265 fathoms" (Benedict; he speaks here of his [both from his own descriptions and figures and from my own investigation of an American specimen] quite stillborn *P. acadianus*); this means from ca. 45° to 37° N. L. — On the other hand I believe that Benedict is right in referring the specimens described by Brandt as *P. Bernhardus* var. *granulato-denticulata* from Unalaska and by Owen as *P. streblonyx* from Kamtschatka to some other species than *P. Bernhardus,* in other words *Eup. Bernhardus* does not occur in the Bering Sea or adjacent regions.

In the "Travailleur" and "Talisman" report A. Milne-Edwards & E. Bouvier introduce their account of the distribution of *Eup. Bernhardus* with the following sentence: "L'*E. Bernhardus* est une espèce arctique dont les représentants se répandent dans les régions septentrionales des deux continents . . .". According to the above this is incorrect; the species is boreal on the coasts of both sides of the Atlantic; it extends somewhat but not far into the regions where arctic forms are as numerous as or a little more numerous than non-arctic species, but not only is it not found in purely arctic waters, it has never been met with at West Greenland nor on the northern or eastern coasts of Iceland.

Remarks. The largest specimen I have seen is from Dyre Fjord on the northern part of the west coast of Iceland; the right chela is 35·5 mm. long and 20 mm. broad.

17. Eupagurus pubescens Kr.

1838. Pagurus pubescens Krøyer, Kgl. D. Vid. Selsk. naturv.-mathem. Afhandl. Syvende Deel, p. 314.
! 1838. — — Krøyer, Naturh. Tidsskr. B. II, p. 251.
! 1846(?) — — Krøyer, Gaimard's Voy. in Scand., Crust. Pl. II, figs. 1 a—u.
1879. Eupagurus pubescens and Krøyeri, S. I. Smith, Trans. Conn. Acad. Vol. V, p. 47 and 48—50.
1894. — pubescens A. Milne-Edwards & E. L. Bouvier, Rés. des Camp. sc. de l'Hirondelle, fasc. VII, p. 74.

Occurrence. The "Ingolf" has taken this species at the following stations.

Baffins Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 2 spec.
— Holsteenborg harbour, 20—30 fm.; 1 spec.
Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 2 spec.
— - 35: 65° 16′ — 55° 05′ — 362 — — 3·6°; 1 —
West of Iceland: St. 97: 65° 28′ N. L., 27° 39′ W. L., 450 fm., temp. 5·5°; 1 spec.
— - — - 89: 64° 45′ — 27° 20′ — 310 — — 8·4°; 1 —
— - — - 87: 65° 02′ — 23° 56′ — 110 — — ?; 3 —
— - — - 9: 64° 18′ — 27° 00′ — 295 — — 5·8°; 4 —
North-West Iceland: Dyre Fjord; 8 spec.
North of Iceland: St. 129: 66° 35′ N. L., 23° 47′ W. L., 117 fm., temp. 6·5°; 5 spec.
— - — - 127: 66° 33′ — 20° 05′ — 44 — — 5·6°; 13 —
South-West of Iceland: St. 81: 61° 44′ N. L., 27° 00′ W. L., 485 fm., temp. 6·1°; 1 spec.
— - — - 73: 62° 58′ — 23° 28′ — 486 — — 5·5°; 2 —

In Malac. Groenl. I have mentioned a large number of localities on the west coast of Greenland, from 72° 37′ N. L. to 60$^2/_3$° N. L. and in depths from fairly shallow water to 290 fm.; numerous later discoveries have not brought any addition of importance. At East Greenland it is extremely rare; for myself I have only seen a single small specimen from Hekla Harbour in Scoresby Sound (70° 27′ N. L., 26° 12′ W. L.) and no foreign expedition mentions it. — I have also seen specimens from a large number of localities on the western, northern and eastern coasts of Iceland, depths from 2 fm. and down to 60—90 fm. It is likewise common at the Færoes, both in shallow water near the coast and out in 100 to 150 fm.; to the S. W. of the Færoes it has been taken in 425—460 fm. and down to 500 fm. ("Michael Sars" and "Thor").

Distribution. The species spreads over the Shetlands and Hebrides (Norman) southward along the English coasts at least to Durham (Norman), and in the Irish Sea (Walker); it is also noted from a point S. W. of Ireland, 200 fm. (Pocock), and this is the most southerly locality for the species on the coasts of Europe known to me. It is also found in the northern part of the Kattegat (Meinert), in the Skager Rak, on the whole coast of Norway (M. Sars), on the north coast of Europe to Nova Zembla, in the White Sea and northern part of the Murman Sea (Birula), at Jugor Schar, 12 fm. (Hansen) and Matotschkin Schar in depths from 4—6 fm. to 60—70 fm. (Stuxberg). It has not been taken in the Kara Sea nor along the north coast of Asia. On the other hand it occurs round Spitzbergen (Doflein and Ohlin) and at Bear Island (G. O. Sars and other authors). On the east coast of America it is found at Labrador (Smith), Gulf of St. Lawrence (Smith), Newfoundland (A. M.-Edwards

& Bouvier), Nova Scotia and southwards along the United States to 37° 8′ N. L.; between ca. 42° and 39° N. L. it has several times been taken at considerable depths, from 300 to 640 fm. — On the north-west and west coast of Alaska: Point Barrow, Franklin Point and Norton Sound, a form has been taken which was determined by Murdoch as *E. trigonocheirus* Stimps.; the differences this author mentions between this species and "*E. pubescens* and *E. Kröyeri*" are very small, but as I have not seen specimens I am unable to prove that *E. trigonocheirus* should be included, though for myself I feel sure of it. Similarly, I think that *Eup. capillatus* Ben., *Eup. Brandti* Ben. and *Eup. Dalli* Ben. could only be called species on a modern, American idea of species and that they will all prove to belong to *Eup. pubescens*. The three species named and *E. trigonocheirus* were all taken at Alaska, the Aleutians, Unalaska and in the Bering Sea; with this is in agreement that Brandt notes *Eup. pubescens* from Kamtschatka.

The species is boreal-arctic, not pronouncedly arctic, as (1) it seems to be lacking in the Kara Sea, at Franz Joseph's Land and Jan Mayen, (2) it is very rare at East Greenland, from which only a single, small specimen has been brought, (3) it appears so far south as in the Irish Sea and south-west of Ireland, (4) it has several times been taken by the "Ingolf" in depths from 300 to 486 fm. but always in the warm area only, and this applies also to its occurrence in the Færoe Channel and on the east coast of the United States, where it goes down to 640 fm.

Remarks. I have twice endeavoured to separate *E. pubescens* Kr. from *E. Kröyeri* Smith in my large material, but without success, and though it is easy enough to refer some specimens to one or other of the two forms other specimens show so many transitional stages, that I must follow G. O. Sars and A. Milne-Edwards & Bouvier in putting them together. Concerning the 4 "species" found at Alaska and the Aleutians, see above. — The largest specimen I have seen is from Ønundar Fjord on the north-west side of Iceland; it was taken in 10—12 fm. and its right chela is 31 mm. long and 16 mm. broad.

18. **Eupagurus tricarinatus** Norm.

1869. Pagurus tricarinatus Norman, Rep. Brit. Assoc. Adv. Science for 1868, p. 264.
! 1885. Eupagurus — G. O. Sars, Den Norske Nordh.-Exped. Zool. Crust. I, p. 11, Pl. II, figs. 8—10.
1892. — variabilis A. Milne-Edwards & Bouvier, Ann. d. Sc. Nat. Zool., 7 Sér. T. XIII, p. 217.
1896. — — E. L. Bouvier, Feuille d. Jeunes Natur., III Ser., 26e Ann., p. 149, figs. 17 & 18.
! 1900. — — A. Milne-Edwards & Bouvier, Expéd. Scient. du Travailleur et du Talisman, Crust. Déc., I., p. 230, Pl. XXVI, figs. 4—12.

Occurrence. 61° 14′ N. L., 2° 13′ E. L., 82 fm., temp. 6·8°, "Michael Sars" 1902 (Ad. Jensen); 2 spec.

Distribution. "In deep water" at the Shetland Isles (Norman); the great ridge W. of Norway (63° 10′ N. L., 5° 25′ E. L.) in 98 fm. (G. O. Sars); south-west of Ireland (Calman); it has also been taken at numerous localities in the Atlantic off the coasts of France, Spain, Portugal and northern Africa southwards to 21° 51′ N. L. and in depths from 62—76 fm. down to 740 fm.; lastly, it is known from the Mediterranean at Sardinia and west end of Sicily (Senna).

Remarks. The two specimens seen by me certainly belong to *Eup. variabilis* A. Milne-Edw. & Bouv. *Eup. tricarinatus* Norm. was taken in deep water near the locality from which my specimens

come; this fact together with Norman's description (as also the account given by G. O. Sars) leads me to consider *Eup. tricarinatus* as identical with *E. variabilis* A. Milne-Edw. & Bouv. instead of referring with the last-named authors *E. tricarinatus* Norm. (and G. O. Sars) as synonym to *Eup. excavatus* Herbst.

19. **Anapagurus lævis** Thomps.

1843. Pagurus lævis W. Thompson, Rep. Brit. Assoc. Adv. Science, p. 267 (without description).
! 1894. Anapagurus lævis A. Milne-Edwards & Bouvier, Rés. des Camp. Sc. de l'Hirondelle, fasc. VII, p. 72, Pl. XI, figs. 16—28.
1896. — — E. L. Bouvier, Feuille d. Jeunes Natur., III Sér., 26e Ann. p. 152, figs. 31—32.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 217, Pl. XXVIII, figs. 9—10.

Occurrence. This species has not been taken by the "Ingolf". I have seen 6 specimens in all from the waters round the Færoes, the first from the Færoe Bank, the second 9 miles east of Bispen (on the most northerly of the islands), 70 fm., the third 12 miles east of the most southerly islands, 150 fm., the fourth from Vestmannahavn, $2^1/_2$—5 fm. (R. Hørring 1901), lastly, 2 specimens from 60° 06′ N. L., 8° 30′ W. L., 62 fm. ("Thor" 1904).

Distribution. It is known at the Shetlands and Hebrides (Norman), spreads from there southward along Great Britain (various authors) and the northern part of the west coast of France (Bonnier), where it was even taken once in so shallow water as 8 fm.; French expeditions have taken it in the Gulf of Gascogne, off the coasts of the Spanish peninsula, at the Azores and off northern Africa right down to 17° 02′ N. L.; lastly, in the Mediterranean at Toulon and Corsica (A. Milne-Edwards & Bouvier), Sardinia and western end of Sicily (Senna), and the greatest depth mentioned is 292 fm. It has also been taken in the Skager Rak and the eastern part of the Kattegat (Metzger, Meinert) in depths from 22 to 80 fm.; on the west coast of Norway northwards to at least ca. $62^1/_2$° N. L. and at this latitude it is "very common and the specimens are unusually large" in 50—60 fm.

20. **Parapagurus pilosimanus** Smith.

1879. Parapagurus pilosimanus S. I. Smith, Trans. Conn. Acad. Vol. V, p. 51.
! 1883. — — S. I. Smith, Proc. U. S. Nat. Mus. Vol. VI, p. 33, Pl. V, figs. 3—5, Pl. VI, figs. 1—4a.
! 1894. — — A. Milne-Edwards & Bouvier, Rés. des Camp. Sc. de l'Hirondelle, fasc. VII, p. 64, Pl. IX, figs. 1—17.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 187, Pl. VI, fig. 2, Pl. XXIV, figs. 1—3.

Occurrence. The "Ingolf" has taken this species at the following stations.
South-West of Iceland: St. 73: 62° 58′ N. L., 23° 28′ W. L., 486 fm., temp. 5·5°; 1 spec.
— - — - 74: 62° 17′ — 24° 36′ — 695 — — 4·2°; 1 —
It has also been taken in the waters south-west of the Færoes, 61° 7′ N. L., 9° 33′ W. L., 425—460 fm.

("Michael Sars", Ad. Jensen), several specimens, and 61° 15′ N. L., 9° 35′ W. L., ca. 500 fm., several specimens ("Thor" 1904).

Distribution. The geographical and bathymetric distribution of this species and of its "var. *abyssorum* A. Milne-Edw." are fully dealt with in the above-mentioned work on the Decapoda of the "Travailleur" and "Talisman". It will be sufficient to give here a short extract from this as also a few critical remarks etc.

The most northerly point in the eastern part of the Atlantic from which the species had previously been taken is south-west of Ireland, 315—1000 fm. (Pocock), and in the western part of the same ocean "off Nova Scotia", 42° 41′ N. L. South of these points the species has been taken by different expeditions at various places in the Atlantic, thus off Portugal, at the Azores, Canary Islands, off Sierra Leone, in the Sargasso Sea, at the Antilles, at Tristan d'Acunha and at Patagonia at 47° 48½′ S. L. In the Arabian Sea and Bay of Bengal it has often been taken (Alcock); in the Pacific it has been found at Papua, Banda, Yokohama, Valparaiso (Henderson), off the northern part of South America, Galapagos Islands and the Gulf of California (Faxon). It has twice been taken in 250 fm. (Smith) and downwards at the most different depths to 2221 fm. (Smith). A. Milne-Edwards & Bouvier write ("Travailleur" and "Talisman", p. 192): "Cette espèce, qui s'accommode également des mers tropicales, des mers tempérées et des mers froides...". But this observation is not correct. When the French authors wrote this account, its southern limit was a little below 48° S. L., its northern about 51° N. L.; the northern limit has been moved by the "Ingolf" almost to 63° N. L., nevertheless it is incorrect to speak of its being an inhabitant of tropical, temperate and cold seas. It is really a deep-water species, which seldom occurs in shallower water than 300 fm. and even at this depth the differences between the temperatures of the different parts of its area of distribution are much less than in depths between 0 and 100 fm.; for example, the lowest temperature at which it was taken by the "Ingolf" was 4·2°.

Remarks. A comparison of my specimens with some of *P. pilosimanus* and of its variety *abyssorum* A. M.-Edw. received by the Museum has shown that the "Ingolf's" specimens belong to the main species and not to the variety; a study of the descriptions given by the French authors led to the same result.

21. Galathea intermedia Lilljb.

1852. Galathea intermedia Lilljeborg, Öfv. K. Sv. Vet.-Akad. förhandl. for 1851, p. 21.
! 1888. — — Bonnier, Bull. Sc. de la France et de la Belgique, 3. Ser. T. 1, p. 44, Pl. X, figs. 1—2, Pl. XI, figs. 1—14.
1894. — — A. Milne-Edwards & Bouvier, Ann. d. Sc. Natur., Zool., Sér. 7, T. XVI, p. 252.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 277.

Occurrence. This species has not been brought home by the "Ingolf" but is present from two places at the Færoes, namely:

Thorshavn (A. Benzon); 2 specimens.

North End of Naalsø, 100 fm. (Th. Mortensen); 1 specimen.

Distribution. The two works cited of 1888 and 1900 give together an almost complete

picture of the distribution of the species. It occurs at the Shetlands (Norman), from there southwards along Great Britain and Ireland, on the Channel coasts, west coast of France and the Spanish peninsula, at the Azores, Canary Islands and Cape Verde Islands to 17° N. L.; it has also been taken in the Mediterranean at Marseilles (Gourret), at Syracuse (author) and Algiers (Lucas). It is also found at Holland (Hoek), in the Skager Rak, northern and the whole eastern part of the Kattegat down into the Sound (Meinert); at Norway if goes up to Lofoten (G. O. Sars), thus somewhat north of the Polar Circle.

A. Milne-Edwards & Bouvier write that it is specially common between 8 and 43 fm., but can go much deeper to 120 fm.; concerning its occurrence at Denmark Meinert says: "the depth as a rule is 15—6 fm." .... "once it was taken in so shallow water as 2 fm."

22. **Galathea nexa** Embl.

? Galathea nexa Embleton, Proc. Berwickshire Nat. Field Club[1].
1853. — — Bell, Brit. Stalk-eyed Crust., p. 204, with fig.
1859. — dispersa Bell, Journ. Linn. Soc. Lond., Vol. III, p. 3.
! 1888. — nexa Bonnier, Bull. Sc. de la France et de la Belgique, Sér. 3, T. 1, p. 63, Pl. XII, figs. 6—8.
! — — dispersa Bonnier, l. c. p. 68, Pl. XIII, figs. 1—3.
1889. — — A. Milne-Edwards & Bouvier, Rés. Sc. de l'Hirondelle (Suppl.) et de la "Princesse Alice", fasc. XIII, p. 72.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 278, Pl. XXIX, figs. 2—3.

Occurrence. It has only once been taken by the "Ingolf".

North-West of the Færoes: St. 1: 62° 30′ N. L., 8° 21′ W. L., 132 fm., temp. 7·2°; 1 spec.

I have seen some specimens from the southern half of the west coast of Iceland, namely, Faxe Fjord, Reykjavik and Grindavik, as also from the Vestmanna Islands on the south coast. It has been taken a number of times at the Færoes, sometimes in the bays, sometimes further off the coast, once in 0—4 fm., otherwise from 8—9½ fm. down to 100 fm.

Distribution. Like the previous species it goes (cf. the French authors cited) southward along Great Britain, France, the Spanish peninsula to the Azores and the Canary Islands (A. Milne-Edwards & Bouvier). It has been taken at several places in the Mediterranean: the Ægean Sea, Adriatic, Marseilles, Villafranca and has been found by the author at Syracuse. I have seen specimens from various places in the North Sea; it has also been taken in the Kattegat and northern part of the Sound; on the west coast of Norway it goes up to West Finmark (Nordgaard). In Dijmphna-Togtet I mentioned having seen a specimen from the Kara Sea; my determination was correct, but as the species neither before nor since has been taken in an arctic sea I must suppose that an error from the expedition in the statement of locality occurred in one way or another.

Remarks. It appears from the synonymy list that like Adensamer[2] I unite the two species *G. nexa* and *G. dispersa* under one. Bonnier has described a specimen of *G. dispersa* in which the third

[1] I have not been able to complete this reference with data and page.
[2] Long after this text was written I see that Appellöf (Nov. 1906) likewise unites them.

maxilliped, to judge from his figure, differs considerably from any of my numerous specimens, which came from many localities, and I entertain grave doubts as to whether Bonnier's figure mentioned is at all correct in the differences it is intended to show from the figure of the same maxilliped in his *G. nexa*. The third maxilliped of some of my specimens agree tolerably well with his figure of *G. nexa*, while in the other specimens it is more or less halfway between his figures of *nexa* and *dispersa*. A. Milne-Edwards & Bouvier (1899) give an account of the differences between *G. nexa* and *G. dispersa*; but a study of my material has given the result that all my smaller specimens belong to *G. dispersa*, whereas some of the largest — in the spines and hairs on the chelæ and also in other respects — approach more or less near to *G. nexa*, without ever having however the form of rostrum described by the French authors. The two largest specimens I have seen are males (from the Færoes); in the one the scutum is 20·2 mm. in the other only 16·3 mm. long. A. Milne-Edwards & Bouvier have only seen a single specimen (♂) of *G. nexa*, Bonnier likewise only one (♂) and both were large. Judging from my material and a comparison of it with descriptions given by these authors I must conclude that *G. nexa* was based on age-characters in single, large and well-marked males of *G. dispersa*. But as this name is much younger than *nexa*, the latter must be used for the species as now understood.

23. **Munida bamffica** Penn.

Pl. II, fig. 3 a.

1777. Astacus bamffius Pennant, Brit. Zool., Vol. IV, p. 17, Pl. XIII, fig. 25.
1882 Munida rugosa G. O. Sars, Vid. Selsk. Forh. Christ. for 1882, no. 18, Tab. I, Fig. 5.
— — Rondeletii G. O. Sars, Vid. Selsk. Forh. Christ. for 1882, p. 43, Tab. 1, Fig. 4.
! 1894. — bamffica A. Milne-Edwards & Bouvier, Rés. des Comp. Sc. de l'Hirondelle, fasc. VII, p. 83, Pl. VII, figs. 1—7.
1899. — — A. Milne-Edwards & Bouvier, Rés. Sc. de l'Hirondelle (Suppl.) et de la "Princesse Alice", fasc. XIII, p. 75, Pl. IV, figs. 6—16.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 299, Pl. XXIX, fig. 17.

Occurrence. The "Ingolf" has taken this species at 5 stations.

West of Iceland:	St. 98:	65° 38′ N. L.,	26° 27′ W. L.,	138 fm.,	temp. 5·9°;	3 spec.
— - —	- 87:	65° 02′ —	23° 56′ —	110 —	— ? ;	2 —
— - —	- 9:	64° 18′ —	27° 00′ —	295 —	— 5·8°;	1 —
— - —	- 85:	63° 21′ —	25° 21′ —	170 —	— ? ;	4 —
South of Iceland:	- 54:	63° 08′ —	15° 40′ —	691 —	— 3·9°;	5 —

Further, it has been taken at 63° 15′ N. L., 22° 23′ W. L., 115—173 fm. ("Thor" 1903) and three times near the Færoes, namely: 8—10 miles N. of the Færoes, 5 specimens; 12 miles east of the most southerly island, 150 fm., 3 specimens; and 61° 9′ N. L., 7° 54′ W. L., 180 fm., temp. 8·4°, 1 specimen.

Distribution. It is impossible at present to treat this subject fully at all points, as the French authors cited above have wrongly included *M. tenuimana* G. O. Sars as a synonym under *M. bamffica*. and it is very probable that several of their localities, as also of the following authors (Caullery,

Adensamer, Senna), for the last-named species really refer to the former, though it should be added that we can by no means conclude that the specimens referred by A. Milne-Edwards & Bouvier to *M. bamffica* var. *tenuimana* really belong even to *M. tenuimana* Sars (see below).

M. bamffica is known from the Shetlands and from there along the coasts of Great Britain and Ireland (various authors), on the west coast of France and according to A. Milne-Edwards & Bouvier it goes further south to Madeira and past Cape Boyador to 25° 41′ N. L. It is widely distributed in the Mediterranean: the Cyclades (Adensamer), and common in the Adriatic and further west. In North Europe, it has been taken at Bohuslän (Goës), also along the whole west coast of Norway, on the east coast at Vadsø in Varanger Fjord (G. O. Sars), in the west part of the Murman Sea, finally at 73° 34′ N. L., 17° 20′ E. L. (Birula).

The species has been found rarely in so shallow water as 13 fm., at England (Bate, teste A. M.-Edw. & Bouv.) and in the Mediterranean; in the Mediterranean it has been taken several times in 30 to 40 fm., but both to the north and south it is most common in depths between 100 and 300 fm.; the greatest depth I can mention with certainty for it is 691 fm. ("Ingolf"), as it cannot be determined whether the depth 750 fm. from the Gulf of Gascogne (Caullery) applies to this or the following species.

Remarks[1]. In 1882 Sars gave three species for Norway. Of these *M. Rondeletii* Bell is certainly identical with *M. bamffica* Penn. (= *M. rugosa* Fabr.; Sars). Sars states of *M. Rondeletii* that he has seen "three specimens all of relatively very considerable size"; I have also seen two very large males from Norway which agree well with Sars' descriptions and figures of this "species", but I think nevertheless that the species is only based on characters which are found in very large males or are untrustworthy for other reasons. The eyes are strikingly small, but I cannot say with Sars that the circle of setæ at the eye is wanting, as my specimens show at places a row of short bristles which seem to have been torn or broken. The lack of a pair of spines on the 4th abdominal segment (not 3rd, as Sars states) is too unimportant and also, according to A. Milne-Edwards & Bouvier, not maintainable as a character even within *M. bamffica* and the reduced dimension of the eyes seems to me an age-character. My view is also strengthened by the fact that Sars seems to have only 3 very large, but no smaller, specimens of the "species". — *M. tenuimana* G. O. Sars is on the other hand a well-founded species, and on describing it later the chief differences between it and *M. bamffica* will be mentioned. It is therefore incorrect of A. Milne-Edwards & Bouvier — followed by several others — in their various publications to include *M. tenuimana* Sars as a variety connected with the principal form by transitional stages, and it cannot be determined whether they have seen the real *M. tenuimana* or not. The specimen figured by these authors in 1900 (Pl. XXIX, fig. 18) must certainly be a true *M. bamffica,* to judge from the lack of submedian spines on the hind margin of the scutum and the form of this.

All the specimens from the "Ingolf" are small to almost medium-sized; the largest, from St. 54, is a male 53 mm. long, and there is a female 40 mm. long from the same station which had numerous eggs and a number of newly hatched zoëæ attached to the abdominal legs.

[1] Years after I had written the text here I received Dr. Appellöf's work (in Nov. 1906). This author rightly maintains *M. tenuimana* G. O. S. without having observed its best character however; on the other hand he retains *M. rugosa* G. O. S. as distinct from *M. bamffica* (= *M. Rondeletii* Bell). Without being able to follow him in this I may refer to his account; I may add that I have thought it best to make no changes whatsoever in my own account.

24. **Munida tenuimana** G. O. Sars

(Pl. II, fig. 4a; Pl. III, fig. 1a).

1872. Munida tenuimana, G. O. Sars, Vid. Selsk. Forh. Christiania, f. 1871, p. 257.

! 1882. — — — — — — — f. 1882, no. 18, p. 44, Tab. 1, Fig. 6.

Occurrence. The "Ingolf" has taken this species at a number of localities.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 1 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 4 —

— — - 25: 63° 30′ — 54° 25′ — 582 — — 3·3°; 1 —

West of Iceland: St. 16: 65° 43′ N. L., 26° 58′ W. L., 250 fm., temp. 6·1°; 1 spec.

— - — - 97: 65° 28′ — 27° 39′ — 450 — — 5·5°; 32 —

— - — - 89: 64° 45′ — 27° 20′ — 310 — — 8·4°; 11 —

— - — - 90: 64° 45′ — 29° 06′ — 568 — — 4·4°; 13 —

— - — - 9: 64° 18′ — 27° 00′ — 295 — — 5·8°; 34 —

South-West of Iceland: St. 73: 62° 58′ N. L., 23° 28′ W. L., 486 fm., temp. 5·5°; 11 spec.

— - — - 84: 62° 58′ — 25° 24′ — 633 — — 4·8°; 13 —

— - — - 69: 62° 40′ — 22° 17′ — 589 — — 3·9°; 4 —

— - — - 74: 62° 17′ — 24° 36′ — 695 — — 4·2°; 1 —

— - — - 81: 61° 44′ — 27° 00′ — 485 — — 6·1°; 7 —

— - — - 78: 60° 37′ — 27° 52′ — 799 — — 4·5°; 104 —

South-East of Iceland: - 52: 63° 57′ — 13° 32′ — 420 — — 7·9°; 1 chela.

I have also seen specimens from 64° 42′ N. L., 27° 43′ W. L., 426 fm., temp. 6° (Wandel); 62° 12·5′ N. L., 20° 06′ W. L., 271 fm. ("Thor" 1903); 62° 57′ N. L., 19° 58′ W. L., 509 fm. ("Thor" 1903); from the two following localities lying south-west of the Færoes ("Michael Sars" 1902): 61° 8′ N. L., 9° 33′—9° 46′ W. L., 425—460 fm., 1 specimen, and 59° 28′ N. L., 8° 1′ W. L., 580—687 fm., 5 specimens; lastly, it has been twice taken in 1904 ("Thor") near the first-named of the "Michael Sars" stations.

Distribution. The species was taken by Sars in the deep Norwegian fjords lying between about 60° and 68° 12′ N. L., in depths between 300 fm. and 672 fm. In the Skager Rak it has been taken by Joh. Petersen in 210, 265 and 300 fathoms. From these data with those of the "Ingolf" etc. we see that the species is commonest in depths between 300 and 600 fm., the extreme limits being 210 fm. and 800 fm.; the bottom-temperatures were between 3·3° and 8·4°. It certainly goes tolerably far southwards in the deeper water of the Atlantic off southern Europe and perhaps northern Africa, but future investigations must determine more precisely how far it has been confused with *M. bamffica*.

Remarks. The largest specimen, a female from the Skager Rak, is 87 mm. long to the tip of the rostrum; the largest "Ingolf" specimen is an egg-bearing female from St. 27; if the rostrum were complete it would measure ca. 74 mm.; the largest of the more than a hundred specimens from St. 78 is a male 64 mm. long. As can be seen, my material is very large and I have found it very easy to separate every single specimen that was at least about 20 mm. long from the previous species with perfect certainty. The best character is given by the sternum of the thorax, which has hitherto been overlooked. In both species the sternum is divided into 4 segments by raised cross-lines furnished

with marginal hairs. In *M. bamffica* it is further as if covered with scales almost everywhere, which is due to the presence of numerous large and small, slightly arched tubercles, the convex anterior or outer margin of which is well marked off and provided with hairs (fig. 3 a); in a specimen of only 13 mm. total length, rostrum included, this sculpture is weakly developed. In *M. tenuimana* the sternum is very shiny and without the scale-formation as in *M. bamffica;* there are some rows of bristles on a part of the first sternal segment but the scale-like tubercles are rudimentary, and as a rule the second, third and fourth segments are smooth, with altogether extremely few short rows of hairs chiefly out towards the lateral margins; sometimes also we meet with a small number of such rows scattered over the surface of the segments, but the scale-formation, i. e. the raised seemingly imbricate areas, are never developed (fig. 4 a). In *M. tenuimana* the submedian spines on the hind margin of the scutum are not only always present, they are large and directed strongly outwards; the spines on the 2nd—4th abdominal segments are large, very prominent and, especially the submedian, considerably larger and more prominent than in any specimen of *M. bamffica.* In *M. tenuimana* the bristles on the base of the upper margins of the eyes are short to very short, but cannot ever be said to be quite wanting. The lateral margins of the scutum are less convex than in *M. bamffica,* the more slender chela are laid stress on by Sars in the choice of the specific name. — After examining my large material I am quite certain of the independence of the species *M. tenuimana.*

25. **Munida microphthalma** A. M.-Edw.

1880. Munida microphthalma A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, no 1, p. 51.
! 1897. — — A. Milne-Edwards & Bouvier, Mem. Mus. Comp. Zool. Vol. XIX, p. 32. Pl. II, figs. 9—13.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 292.

Occurrence. This species has not been brought home by the "Ingolf", but it was taken by the "Thor" in 1903 at the following locality.

South of Iceland: 62° 10·8′ N. L., 19° 36′ W. L., 1080—1144 fm., 2 spec.

Distribution. The most northerly place in the Atlantic at which this species had previously been taken was 45° 39′ N. L. in the Bay of Biscay ("Talisman"). It was founded on specimens taken in the West Indies by the "Blake"; the "Challenger" took it near Ascension and north of Kermadec Islands in the Pacific. With some uncertainty a specimen taken by the "Albatross" at Cocos Islands in 134 fm. is ascribed to it, and the French authors cited consider it most probable that *M. microps* Alcock of the Indian Ocean is a variety of the same species, but in 1901 Alcock maintains his *M. microps* as an independent species "very closely related to *M. microphthalma* A. M.-Edw." The greatest depth at which even the main form is known to have been taken is 804 fm., so that the depth given by the "Thor" is not a little larger.

26. **Galacantha rostrata** A. M.-Edw.

1880. Galacantha rostrata A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, no 1, p. 52.
1884. — — S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 21, Pl. IX, figs. 2—2 a.

! 1897. Galacantha rostrata A. Milne-Edwards & Bouvier, Mem. Mus. Comp. Zool. Vol. XIX, p. 60, Pl. IV, figs. 21—24.

1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 308, Pl. VI, fig. 9.

Occurrence. The "Ingolf" has been so fortunate as to take this beautiful species at one station.

West of Iceland (halfway between Iceland and Greenland): St. 11: 64° 34′ N. L., 31° 12′ W. L., 1300 fm., temp. 1·6°, 2 specimens.

Distribution. On the American side of the Atlantic this species has been taken at Bequia, Antilles (1591 fm.) and from there northwards to 40° 17′ N. L. It was also taken by the "Talisman" off northern Africa at about 30° N. L.; these specimens were described by A. Milne-Edwards as *G. Talismani,* under which name a specimen from Banda (ca. 130° E. L.) was included by Henderson in the "Challenger" Anomura, p. 167, Pl. XX, fig. 1; later, Milne-Edwards & Bouvier included *G. Talismani* as a synonym and also considered the Banda specimen as belonging to *G. rostrata.* Henderson (l. c. p. 167, Pl. XIX, fig. 6) also describes a *G. bellis* and considers it different from *G. rostrata,* but it is taken as a variety by the French authors. Faxon (Mem. Mus. Comp. Zool. Vol. XVIII, p. 78, Pl. B, figs. 1, 1 a) had however in 1895 already both disputed the correctness of considering *G. bellis* as a species and had referred seven specimens taken at three stations west of Columbia or north of the Galapagos Islands to *G. rostrata.* He adds, it is true, that his specimens "differ constantly from the typical West Indian form in the following particulars", but these seem to be small. In 1901, Alcock (Descrip. Catal. p. 274) gives *G. rostrata* as having been taken in the Arabian Sea and Bengal Bay in depths from 1022 to 1520 fm. To sum up, during the last ten years authors have come more and more to the conclusion, that the specimens taken in the different seas belong to *G. rostrata* and that this shows some variation in the length of the spines and in the sculpture. I think that A. Milne-Edwards & Bouvier are quite right when they say (1900), that "*G. rostrata* est une espèce cosmopolite répandue vraisemblablement dans les profondeurs de toutes les mers chaudes ou tempérées". The "Ingolf" has now also shown that the species occurs at ca. $64^1/_2$° N. L. between Iceland and Greenland; the surface-water here belongs to purely arctic regions, but in deep water at 1300 fm., where the species was taken, the temperature and other conditions of the sea are certainly nearly identical with those found in similar depths between the tropics. *G. rostrata* has only been taken in depths between 1022 fm. (Arabian Sea) and 1591 fm. (Antilles).

Remarks. Both my specimens are males; the larger is 58 mm. long to the tip of the rostrum. When they had just come from the water I noticed that they were reddish yellow in colour with pale red eyes.

27. **Munidopsis curvirostra** Whiteaves.

(Pl. III, figs. 2 a—2 e).

1874. Munidopsis curvirostra Whiteaves, Ann. Journ. Science 3 Ser. Vol. VIII, p. 212.

1884. — — S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 21 (sine descript.) Pl. VIII, figs. 2, 3, 3 a.

! 1900. — longirostris A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 314, Pl. IV, fig. 1, Pl. XXX, figs. 6—10.

Occurrence. The "Ingolf" has taken this form at six stations.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 20 spec.
— — - 28: 65° 14′ — 55° 42′ — 420 — — 3·5°; 75 —
— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 3 —
South-West of Iceland: St. 76: 60° 50′ N. L., 26° 50′ W. L., 806 fm., temp. 4·1°; 1 spec.
South of Iceland: St. 67: 61° 30′ N. L., 22° 30′ W. L., 975 fm., temp. 3·0°; 1 spec.
— - — - 63: 62° 40′ — 19° 05′ — 800 — — 4·0°; 1 —

It has also been takeu even further north in Davis Straits than any of the localities just mentioned, namely: 65° 36′ N. L., 56° 24′ W. L., 349 fm., temp. 3·2°, 5 specimens, (Wandel, 1889).

Distribution. The species was first observed in the Gulf of St. Lawrence, 180—220 fm. (Whiteaves); later, at a number of places off the east coast of the United States, between 39° and 40° N. L. in depths from 384 to 1230 fm. and at 33° 35$^1/_3$′ N. L., 647 fm. Under the name *M. longirostris* A. M.-Edw. & Bouv. it is noted from the Newfoundland waters, 46° 05′ N. L., 49° 02$^1/_2$′ W. L., 674 fm., also from off the Sudan at about 30° N. L. in 1104 and 1175 fm. (A. Milne-Edwards & Bouvier). — The occurrence of this deep-water species right up to 65° 36′ N. L. in the Davis Straits is one of the many indications that the bottom of the deep part of that sea belongs in zoogeographical regards to the Atlantic. It is not improbable further, that this species will prove to have a much greater distribution than is known at present.

Remarks. The spiny armature on the gastric area is extremely variable: as a rule there are three spines, namely, one on each side of the middle line and one unpaired somewhat further back (fig. 2 a). Sometimes not one but two unpaired spines occur (fig. 2 c), one behind the other; in one specimen the number of spines mounted to nine (fig. 2 d), namely, three in the median line and three on each side all well-developed except the posterior set of paired spines which were small. In contrast to this I have met with an adult specimen in which the spines, four altogether, the most .posterior spine excepted were reduced to fairly low, transverse tubercles (fig. 2 e). One of the largest specimens (from Stat. 28) is a male, in which the carapace measures 25$^1/_2$ mm. to the tip of the rostrum (the rostrum however is in reality 12 mm. and the carapace itself without the rostrum 15 mm. long), while the greatest breadth is 11$^1/_2$ mm.

I have compared a small "Talisman" specimen of *M. longirostris* taken off the Sudan with one of similar size from the "Ingolf" St. 28 and found the most perfect agreement between them; this specimen agrees fairly well also with the description of *M. longirostris* by the French authors, but it should be remarked, that I have not seen either in their co-type or in my smaller "Ingolf" specimens anything similar to the carapace as figured by them, in which the breadth is considerably greater in front than near to the posterior margin and the process from the front outer angle is long and broad.

The species stands fairly near to *M. simplex* A. M.-Edw. as was already noted by the French authors, who indicate a number of differences in the "Travailleur" and "Talisman" reports. I have examined one of their co-types of *M. simplex* from St. Vincent, West Indies and consider it a good species, which in addition to the differences summarised by A. Milne-Edwards & Bouvier is distinguished from *M. curvirostris* by its longer and more slender chela.

28. **Munidopsis Antonii** A. M.-Edw.

Pl. III, figs. 3 a—3 b.

1884. Galathodes Antonii A. Milne-Edwards, in Filhol, La Nature Vol. XII, p. 231, fig. 2 (teste A. M.-Edw. & Bouvier).

1888. Munidopsis Antonii Henderson, Challenger Anomura, T. XXVII, p. 151, Pl. XVIII, fig. 1.

! 1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 321, Pl. IV, fig. 2, Pl. XXX, figs. 21—25.

Occurrence. This species was taken by the "Ingolf" at a single station.

Southern Part of Davis Straits: St. 36, 61° 50′ N. L., 56° 21′ W. L., 1435 fm., temp. 1·5°; 1 spec.

Distribution. A. Milne-Edwards & Bouvier note the species from two points north of the Azores at 42° 15′ N. L. and 42° 19′ N. L. where the depth was 2114 and 2133 fm. In the "Challenger" the species is noted from west of Valparaiso, 1375 fathoms and S. W. of Australia, 1800 fm.

Remarks. My single specimen, a female, has been compared both with the descriptions of A. Milne-Edwards & Bouvier and with a co-type from the Paris Museum. My specimen differs only in that the rostrum is somewhat longer, the spine on the outer corner of the second antennal segment longer and more pointed, reaching out a little past the centre of the outer margin of the following joint, and lastly in that it has four pairs of spines on the gastric area. In all other respects, viz. antennules, eyes, granulation on the thorax, spines and granulation on the legs, it agrees with the description and the Paris specimen. Concerning the rostrum it may be remarked that, according to the measurements of the French authors, this was 14·5 mm. long in a female in which the cephalothorax with rostrum was 45 mm., that is, scarcely a third of the latter length; in my specimen the cephalothorax with rostrum is 26 mm., the much upward curved rostrum 8·8 mm., thus a little over a third of the whole length. For the rest, my figures of the cephalothorax will show the details in the spiny armature.

29. **Munidopsis similis** Smith.

Pl. III, figs. 4 a—4 b.

1885. Munidopsis similis S. I. Smith, Proc. U. S. Nat. Mus., VII, p. 496.

! 1887. — — — Rep. U. S. Comm. Fish and Fisheries for 1885, p. 647, Pl. V, figs. 1—1 e, Pl. VI, figs. 2—2 a.

Occurrence. This species has been taken once by the "Ingolf".

West of Iceland (halfway between Iceland and Greenland): St. 11: 64° 34′ N. L., 31° 12′ W. L., 1300 fm., temp. 1·6°; 1 spec.

Distribution. *M. similis* was founded on a specimen taken off the east coast of America at 39° 46½′ N. L. in 1060 fm.; *M. crassa* Smith, to which *M. similis* appears to belong as a variety, was founded on a specimen taken off the east coast of America at 36° 16½′ N. L., in 2574 fm. There is also considerable probability that *Munidopsis subsquamosa* var. *aculeata* Hend. belongs to *M. crassa* + *M. similis* and this form was taken by the "Challenger" west of Patagonia, 1450 fm. and "between Marion Island and the Crozets", 1375 fm.

Remarks. S. I. Smith founded *M. similis* on a single female, in which the carapace (with rostrum) was 24·2 mm. long; he states that it "is very closely allied to *M. crassa,* and will possibly prove to be a variety of it", but of *M. crassa* he had only seen his type-specimen, a very large female, in which the carapace with rostrum measured 65 mm. My single specimen, a female with eggs, stands nearer to *M. similis* than to *M. crassa,* but is somewhat larger than the former, as the carapace with rostrum is 40 mm., the rostrum itself 12·4 mm., and it differs from both and especially from *M. crassa* in that the rostrum is longer, narrower and more curved upwards and in that the spiny armature along the anterior margin of the carapace is reduced to but a single process outside the basis of the antennæ. The gastric area has two larger and five smaller spines as also a number of granules and on the posterior half a number of smaller, flat tubercles; the hepatic area has some smaller, round tubercles; on the posterior half of the carapace there are numerous raised portions which have a certain resemblance to transverse keels and are from three to more times as long as broad. The rostrum is strongly recurved, narrow in its distal two-thirds, upper margin keeled, under side flat and lateral margins with three to four serrations at the middle. The antero-lateral process on the carapace is of good size, another but smaller process is present about halfway between this and the basis of the antenna and between this and the rostrum the anterior margin is smooth; the lateral margin has some smaller spines, one or two of which are situated on the anterior angle of the posterior branchial area. The furrows between the different areas of the carapace are well-marked and smooth. The eyes, antennules and the limbs on the cephalothorax agree with the corresponding parts of *M. similis* in the features in which S. Smith finds differences between this form and *M. crassa.* The abdomen is essentially intermediate between those in *M. similis* and *M. crassa.* For the rest, my figures show all these features in my specimen.

The eggs are ca. 3 mm. in diameter. — Just after the specimen came up in the trawl, I noted that it was uniformly white with yellowish red eyes, while the eggs were bright scarlet red.

As a result of the above I have considered myself justified in referring my specimen to *M. similis* Smith; so long as it cannot be determined with certainty that this species should be included under *M. crassa* as a variety or only as a synonym, I have thought it best to keep the first name. Under "distribution" I have further expressed my views concerning *M. crassa, M. similis* and *M. subsquamosa* var. *aculeata* Hend.

30. **Uroptychus nitidus** A. M.-Edw. **var. concolor** A. M.-E.

1888. Diptychus nitidus A. Milne-Edwards, Bull. Mus. Comp. Zool. Vol. VIII, p. 62.

1894. — — , var. concolor, A. Milne-Edwards & Bouvier, Ann. Sc. nat., Zool., Sér. 7, T. 16, p. 225, fig. 16, fig. 21.

! 1900. — — — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I., p. 360, Pl. IV, fig. 4, Pl. XXXII, figs. 15—19.

Occurrence. The "Ingolf" has brought home a single specimen.

South-West of Iceland: St. 84: 62° 58′ N. L., 25° 24′ W. L., 633 fm., temp. 4·8°; 1 spec.

Distribution. The species was first taken by the "Blake", later by the "Challenger" at the

Antilles; A. M.-Edwards & Bouvier (Mem. Mus. Comp. Zool., XIX, p. 139) state: "L'espèce typique paraît être localisée dans la mer des Antilles....., elle ne remonte pas au-dessus de 80 brasses et descend jusqu'à 573", and they continue: "Elle est représentée dans les eaux orientales de l'Atlantique par la variété *concolor* A. Milne-Edwards et E. L. Bouvier du Talisman (495 à 1600 mètres), et dans le Pacifique oriental par la variété *occidentalis* Faxon de l'Albatross (495 brasses)". I think that "var. *concolor*" really belongs to *U. nitidus* as a variety; "var. *concolor*" has been taken by the "Caudan", "Travailleur" and "Talisman" in the Gulf of Gascogne and from there southwards to the Cape Verde Islands, in 495—1710 meters, also in the Indian Ocean off Cape Natal, 440 fm. (Stebbing). Alcock (1899) gives *U. nitidus* — presumably not the typical form but var. *concolor* — from the Laccadives, 636 fm., and from the Bay of Bengal, 320—296 fm. It appears to me somewhat more doubtful whether var. *occidentalis* Faxon is a variety of *U. nitidus* or an independent species, as Faxon (Mem. Mus. Comp. Zool. XVIII, p. 101) gives several differences between the two, but naturally I can contribute nothing to the solution of the question. Faxon has only had four specimens of his *U. nitidus* var. *occidentalis* from a station in the Gulf of Panama, 458 fm. (the 495 cited above from the French authors must have been an error in printing).

Remarks. I have compared the "Ingolf" specimen with two specimens of *U. nitidus* var. *concolor* taken by the "Talisman" and found complete agreement.

31. **Uroptychus rubro-vittatus** A. M.-Edw.

1881. Diptychus rubro-vittatus A. Milne-Edwards, C. R. Acad. Sc. 5. déc. 1881 (teste A. M.-Edw. & Bouvier).
! 1894. — — A. Milne-Edwards & Bouvier, Rés. des Camp. Sc. de l'Hirondelle, Fasc. VII, p. 88, Pl. VI, figs. 1—12.
1900. — — A. Milne-Edwards & Bouvier, Exp. Scient. du Travailleur et du Talisman, Crust. Déc., I, p. 356, Pl. XXXII, figs. 6—14.

Occurrence. This species was not brought home by the "Ingolf"; on the other hand it was taken by the "Thor" in 1903 at the following locality.

South of Iceland: 63° 12,5′ N. L., 20° 06′ W. L., 300 fm.; 13 spec.

Distribution. The species has been taken several times in the eastern Atlantic, namely, off northern Africa and southern Europe between 26° 20′ N. L. and 46° 40′ N. L. as also at the Azores (A. Milne-Edwards & Bouvier, Bonnier, Caullery). The depth was from 160 to 744 fm. Its occurrence south of Iceland is interesting.

Remarks. Some of the specimens taken are remarkable for their quite unusual size; they are much larger than those whose measurements are given in the literature and I may therefore give some details concerning them. The largest male has the following dimensions: length from tip of rostrum to end of abdomen 33 mm., thorax with rostrum 18 mm., left first leg 63 mm.; in the largest female with eggs the length of the body when stretched was 40 mm., of thorax with rostrum 17·7 mm., left first leg 56 mm.

C. Macrura.

32. **Calocaris Macandreæ** Bell.

1853. Calocaris Macandreæ Bell, Brit. Stalk-eyed Crust. p. 233, with fig.
1892. — — Ortmann, Zool. Jahrb., Syst., B. VI, p. 50, Taf. I, Fig. 5.
1901. — — Alcock, Descr. Cat. Indian Deep-Sea Crust. Dec. Macr. and Anomala, p. 189.

Occurrence. The "Ingolf" has taken only one specimen of this species.

South of West Iceland: St. 69: 62° 40′ N. L., 22° 17′ W. L., 589 fm., temp. 3·9°; 1 spec.

Distribution. According to the literature the distribution of this species is as wide as it is remarkable. It was first observed on the west coast of Scotland at ca. 56° N. L., and also in Irish waters. On the south and west coasts of Norway it has been taken at a number of localities in deep water, down to 217 fm. at least; the most northerly of these places was Trondhjem Fjord (Storm, 1878); it was also taken at Bohuslän (Goës) and in the north-easterly part of the Kattegat, in 49 to 25 fm. (Meinert). It has been taken in the deep part of the western Mediterranean by the "Travailleur" (A. Milne-Edwards), also in the Adriatic in depths from 70 to 630 fm. On the east coast of America it has been taken in the Gulf of St. Lawrence in 190 fm. (Whiteaves, test. Smith). While there is no reason for doubt that all these indications refer to this species, the following two appear to me very remarkable. Kirk (test. Alcock & Anderson) states that he has found two dead specimens at New Zealand; Alcock also (l. c.) mentions some specimens from the Arabian Sea, 636 fm., and from the Bay of Bengal, off Ceylon, 800–637 fm. Unfortunately, Alcock says nothing as to how far he has made a direct comparison between European and Indian specimens, but he describes his Indian specimens and is so careful an observer on Decapoda that his determination should presumably be accepted.

Remarks. The single specimen lacked the first pair of thoracic legs and several other parts. It differs a little in the form of the rostrum from Danish specimens; in other details I found no difference.

33. **Polycheles sculptus** Smith.

1880, April. Polycheles sculptus S. I. Smith, Ann. & Mag. Nat. Hist. 5. Ser., Vol. V, p. 270.
1880, December. Pentacheles spinosus A. Milne-Edwards, Bull. Mus. Comp. Zool., Vol. VIII, p. 66.
! 1882. Pentacheles sculptus S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, p. 23, Pls. III & IV.
1901. Polycheles — Alcock, Descr. Cat. of Ind. Deep-Sea Crust. Dec. Macr. and Anomala, p. 170.

Occurrence. The "Ingolf" has taken this beautiful species at a single station.

South of West Iceland: St. 69: 62° 40′ N. L., 22° 17′ W. L., 589 fm., temp. 3·9°; 1 spec.

Distribution. Smith gives it from various stations off the east coast of America between 35° 49½′ N. L. and 43° 10′ N. L., 250 to 843 fm. A. Milne-Edwards has had it from six stations in the West Indies, depths from 611 fm. to "1568—1400" fm. It is also known from the Gulf of Gascogne, depths from 346 to 638 fm. (Caullery), from the Mediterranean north-west of Sardinia, 1140 fm. and lower to 1494—1508 fm. (Senna), from the Indian Ocean off Cape Natal, 440 fm. (Stebbing) and from the Arabian Sea, 738, 824 and 836 fm. (Alcock). Faxon mentions a form, which he with

good reason considers a local variety and calls *P. sculptus pacificus* Fax., from the Pacific off the west coast of America between Ecquador and the northern tropics, depths from 511 to 1270 fm.

Remarks. The single specimen is a male 84 mm. long; it agrees excellently with Smith's description.

34. Polycheles nanus Smith.

1884. Pentacheles nanus S. I. Smith, Rep. Comm. Fish & Fisher. f. 1882, X, p. 359.
! 1886. — — S. I. Smith, — — — - — f. 1885, XIII, p. 651, Pl. VII, figs. 1—1 a.
1895. Polycheles — Faxon, Mem. Mus. Comp. Zool., Vol. XVIII, p. 121, Pl. XXXIII, figs. 1, 1 a, 1 b.

Occurrence. The "Ingolf" has taken this species at the following 12 stations.

Davis Straits: St. 36: 61° 50′ N. L., 56° 21′ W. L., 1435 fm., temp. 1·5°; 2 spec.

West of Iceland: St. 10: 64° 24′ N. L., 28° 50′ W. L., 788 fm., temp. 3·5°; 2 spec.

South-West of Iceland: St. 18: 61° 44′ N. L., 30° 29′ W. L., 1135 fm., temp. 3·0°; 6 spec.

— - — - 83: 62° 25′ — 28° 30′ — 912 — — 3·5°; 10 spec.

— - — - 76: 60° 50′ — 26° 50′ — 806 — — 4·1°; 3 —

— - — - 74: 62° 17′ — 24° 36′ — 695 — — 4·2°; 1

South of Iceland: St. 68: 62° 06′ N. L., 22° 30′ W. L., 843 fm., temp. 3·4°; 1 spec.

— - — - 67: 61° 30′ — 22° 30′ — 975 — — 3·0°; 2 —

— - — - 40: 62° 00′ — 21° 36′ — 845 — — 3·3°; 3 —

— - — - 66: 61° 33′ — 20° 43′ — 1128 — — 3·3°; 1 —

— - — - 64: 62° 06′ — 19° 00′ — 1041 — — 3·1°; 2 —

— - — - 41: 61° 39′ — 17° 10′ — 1245 — — 2·0°; 1 —

Distribution. S. I. Smith mentions the species from a large number of stations off the east coast of America between ca. 35° and 41° N. L. in depths from 707 to 1917 fm.; Caullery notes it from a station in the Gulf of Gascogne in the relatively small depth of 355 fm., and Stebbing from South Africa, not far from Cape Point, 750—800 fm. Faxon notes it from the Pacific off the west coast of America between 0° 36′ S. L. and $7^{1}/_{4}$° N. L. in depths between 899 and 1522 fm. The species has thus been taken once in ca. 355 fm. but otherwise in the most different depths between 695 and 1917 fm.

Remarks. The largest "Ingolf" specimen, a female with eggs, is 74 mm. long and came from St. 40; two other females with eggs measure 55 and 59·5 mm. in length and are from St. 18 and St. 41.

When Smith founded the species and gave good characters for it, he remarked at the same time that it "will possibly prove to be only a dwarf deep-water variety of *P. sculptus*" — but with this I cannot agree. My "Ingolf" material is very considerable and gives no indication of *P. nanus* being a variety. Further, Smith himself says: "the distinctive characters are well-marked and very constant in all the large number of specimens seen". Faxon states that his sixteen specimens from the Pacific differ from Atlantic specimens in that the keels and tubercles on the 6th and 7th abdominal segments are lower than in the latter, and he adds: "In these regards the Pacific form resembles *P. sculptus*, adding weight to Professor Smith's suggestion that *P. nanus* may be only a dwarf deep-water variety of *P. sculptus*". The characters indicated by Faxon appear to me however so unimportant in comparison with the remaining characters that *P. nanus* must remain an independent species well-marked off from *P. sculptus*.

I have observed a little variation in the spiny armature on the scutum. The general rule is as described by Smith: "on the middle line of the gastric region back of the two rostral spines there are, at nearly equal distances, first two single spines, one behind the other, than a pair close together, and lastly a single one". In a specimen from St. 18 there is in the middle line three unpaired spines between the frontal and the set of paired spines further back; in a specimen from St. 36 there were on the same line four unpaired spines, the first two closely behind one another; lastly, in a specimen from St. 40 five unpaired spines were present on this line, the three anterior being smaller than the two others and so close together that they are joined at the basal ends.

35. **Nephropsis atlantica** Norm.

! 1882. Nephropsis atlantica Norman, Proceed. Roy. Soc. Edinb., Vol. XI, p. 684.
1896. — — Caullery, Ann. de l'Univer. de Lyon, 1896, p. 384.
1901. — — Alcock, Descr. Cat. of Ind. Deep-Sea Crust. Macr. & Anomura, 1901, p. 161.

Occurrence. This form was not taken by the "Ingolf".

South-West of the Færoes: 61°08′ N. L., 9°46′ W. L., 450 fm., ("Mich. Sars" 1902); 1 large male (Bergen Mus.).
— - — 59°28′ — 8°01′ — 687-580 fm., — — 1 small spec. —

Distribution. This species was first discovered in the Færoe Channel, 555 fm., temp. 5·5° (Norman) and the specimens just mentioned also come from the same region. Later, it was taken by the "Thor" at 49° 25′ N. L., 12° 20′ W. L., 678—628 fm., and in the Gulf of Gascogne in 350 fm. (Caullery); Stebbing notes it from a spot ca. 5 miles north east of Cape Natal and Alcock from the Arabian Gulf near the Laccadives and further north, 636—740 fm.

Remarks. The large specimen is 103 mm. long, right chela 27 mm., the best preserved flagellum on the antennæ measures 237 mm. though its distal end is broken off. Norman gives five spines on the carpus of the first pair of thoracic legs, but my large specimen has six; Smith gives three spines in his *N. aculeatus,* which to judge from the description (Proc. U. S. Nat. Mus. Vol. III f. 1880, p. 431) must be a different species from *N. atlanticus.*

36. **Nephrops norvegicus** L.

1758. Cancer norvegicus Linné, Syst. Nat., Ed. X, p. 632.
! 1853. Nephrops — Bell, Brit. Stalk-eyed Crust. p. 251, with fig.
1863. — — Heller, Crust. südl. Europa, p. 220.

Occurrence. The "Ingolf" has not taken this species, but it was brought home by the "Thor" both in 1903 and 1904. Adult specimens came from the two localities.

South of Iceland: 63° 16′ N. L., 19° 57′ W. L., 138—207 fm.
— - — 63° 29′ — 21° 25′ — 50—69 fm.

Dr. Schmidt tells me that this species was taken by the "Thor" in quantities in this district south of western Iceland and it was so common that it formed the chief food of the cod. The "Thor" took the small pelagic specimens and larvæ in and near the area indicated by the latitude and longitude of the two stations; a young specimen was also taken near Skagi (a little north of Reykjanæs, south-west corner of Iceland).

Distribution. It is remarkable that this species is not known from the Færoes, the Shetlands or the Hebrides. It occurs at Scotland, England and Ireland (Bell), on the Belgian coast (v. Beneden), at Concarneau (Bonnier) and in the Gulf of Gascogne, 136 fm. (Caullery); in the Mediterranean it is known from several points along the Italian west coast and in the Adriatic. It is met with in the Skager Rak, northern Kattegat and a considerable distance down into the Sound (Meinert); it is found at Bohuslän (Goës) and along the whole west coast of Norway (M. Sars). Finally its occurrence in Varanger Fjord and in the western part of the Murman Sea has been stated by Birula, but Appellöf doubts that the species has been taken east of North Cape.

Spongicoloides n. gen.[1]

Body smooth, with exception of about half of the carapace which is adorned with a number of small spines. Rostrum short, compressed. Telson has the posterior end broad and flatly rounded; it is a little longer than the uropods, and with two longitudinal rows of teeth on the upper surface. The exopod of the uropods has no transverse fissure.

Eye-stalks short; eyes of moderate size, with whitish pigment. The antennular peduncle short; its basal point not concave dorsally. The antennal squama of considerable size, with its distal end broadly rounded inside the marginal spine.

First maxillipeds have the exopod well developed; second and third maxillipeds completely without exopod. The three anterior pairs of trunk-legs increase in length in posterior succession so much that the third pair are nearly twice as long as the first. Third pair have the carpus oblong, not triangular, the chela long, very slender, formed essentially as in the two preceding pairs. — Fourth aud fifth pairs of legs have their distal joints undivided; seventh joint terminates in a claw and behind this a somewhat smaller claw-shaped spine is seen.

The abdominal appendages behind the first are biramous.

Eggs very large.

The branchial formula is as follows:

Appendages	Epipods and Podobranchiæ	Arthrobranchiæ	Pleurobranchiæ
Mxp[1]	ep	1 (rudimentary)	0
Mxp[2]	ep + podobr. (rudimentary).	1 (rudimentary)	0
Mxp[3]	ep	1	1
Trl[1]	0	1	1
Trl[2]	0	1	1
Trl[3]	0	1	1
Trl[4]	0	1	1
Trl[5]	0	0	1

[1] The descriptions of the genus and the species are written tolerably in accordance with those given by Prof. A. Alcock of forms of the same family in his valuable work: A descriptive Catalogue of the Indian Deep-Sea Crustacea Decapoda and Anomala, in the Indian Museum. 1901.

Remarks. According to Alcock an exopod is well developed on the external maxillipeds of *Engystenopus* and *Richardina,* while it is quite rudimentary in *Spongicola* (in *S. Koehleri* Caullery I have been unable to find even a rudiment); in *Stenopus* the third maxillipeds possess an exopod. The new genus *Spongicoloides* is more allied to *Spongicola* than to the three other genera in having no exopod on the third maxillipeds, but it differs sharply from all in having no exopod on the second maxillipeds (according to my own observation *Spongicola* has a well developed exopod on mxp^2). In *Spongicoloides* the shape of the carpus and the chela of the third pair of trunk-legs is nearly similar to that in *Richardina* — consequently very different from *Spongicola* and *Engystenopus* — but in *Richardina* the distal joints in the two posterior pairs of trunk-legs are again divided into joints, while they are undivided in *Spongicoloides.* But the branchial formula differs extremely from what is found in the other genera named. These possess two arthrobranchiæ and an epipod on mxp^3 and trl^1 to trl^4, but in *Spongicoloides* the same five pairs of appendages have only a single arthrobranchia (the anterior being absent), and besides trl^1 to trl^4 have no epipod. Finally, in *Spongicoloides* the branchiæ of the trunk-legs are less developed, with their branches much shorter (Pl. IV, fig. 1 i) than for instance in *Spongicola.* — In general aspect this interesting new genus shows more resemblance to *Richardina* (according to Alcock's figure of that form) than to any of the other genera.

37. Spongicoloides profundus, n. sp.

Pl. III, figs. 5 a—5 k; Pl. IV, figs. 1 a—1 l.

Description. The carapace, which is of very thin texture, is moderately short, slightly compressed and dorsally vaulted, with a number of small spines scattered on the anterior two thirds of the dorsal surface and on the anterior third of the lower part of the sides. The rostrum, which reaches only to the end of the basal antennular joint, is irregularly serrated above (figs. 5 b, 5 c, 5 d), in two specimens with respectively three and two, in a third specimen with no spines on the lower edge behind the acute tip. The eyes are of moderate size, with whitish pigment; the short eye-stalks have no spines.

The antennal squama (fig. 5 f) is slightly more than twice as long as broad; the distal half or two fifths of its outer margin has 4—6 teeth, and the arched front margin overreaches the apical marginal spine. Third maxillipeds somewhat shorter than trl^1; their ischium and merus distinctly broadened.

The first three pairs of trunk-legs are truly chelate. First pair (figs. 1 d and 1 e) slender, shorter, slightly more than half as long as the third pair; second pair only a little shorter than the third, reaching about to the base of its movable finger, but its distal half is much more slender than that of the third pair. Third pair (fig. 1 f) with the carpus somewhat more than twice as long as broad; the chela is nearly as long as the sum of ischium, merus and carpus, besides extremely slender, being $5^1/_2$ times as long as broad. Fourth and fifth pairs of legs (fig. 1 g) have the carpus even a little more than twice as long as the propodus, and both joints show no vestige of subdivision; the terminal part of these legs is shown in fig. 1 h.

The abdomen is smooth, only the telson has two considerably diverging longitudinal rows of

teeth on the surface (fig. 1 l), and the surface between these rows is concave. First pleopods in the female uniramous. The uropods have the outer margin of the exopod serrated almost to the base (fig. 1 l).

The eggs are few and very large.

Length of the largest specimen, an ovigerous female, 24 mm.

Occurrence. The specimens seen have been taken by the "Ingolf".

South-West of Iceland: St. 78: 60° 37′ N. L., 27° 52′ W. L., 799 fm., temp. 4·5°; 4 spec.

Among the specimens two are ovigerous females; the third specimen is scarcely adult, and the fourth only half-grown. The station is very interesting: the trawl came up filled with enormous quantities of various sponges, and the number of species of Malacostraca (especially belonging to the orders Tanaidacea, Isopoda and Amphipoda) is really astonishing, probably larger than in any other single haul secured during any expedition.

38. Crangon Allmani Kin.

1857. Crangon Allmani Kinahan, Nat. Hist. Review, Vol. IV, p. 81 (teste Kinahan).

! 1864. — — — Proc. Roy. Irish. Acad., Vol. VIII, p. 71, Pl. IV.

Occurrence. This species has not been brought home by the "Ingolf", but it has been taken a number of times by different zoologists especially of recent years.

West coast of Iceland: 65° 52′ N. L., 23° 58′ W. L., 32 fm., "Thor" 1904.

— - — Faxe Fjord, soft mud and Laminaria. R. Hørring; 1 spec.

— - — Skagi, 21 fm., "Thor" 1904.

South-West of Iceland: 63° 46′ N. L., 22° 56′ W. L., 80 fm., "Thor" 1904; many spec.

South of Iceland: West of Geirfugleskjær, Young-fish trawl, 100 m. wire out, "Thor" 1904; 6 spec.

— - — 63° 30′ N. L., 17° 31′ W. L., 92 fm., mud, temp. 4·7°; Wandel 1891, 1 spec.

— - — 63° 50′ — 16° 31′ — 31 fm., "Thor" 1904; 3 spec.

South-East coast of Iceland: Lomsvig, 21 fm., A. C. Johansen; 1 spec.

Færoes: 6 miles N. W. of Kalsö, 60 fm., Th. Mortensen; 2 spec.

— Trangisvaag, 1—3 fm. and 8—9½ fm., Dr. Jørgensen; 4 spec.

Distribution. The species has previously been taken at Reykjavik in 20—30 fm. (G. O. Sars), the Shetland Isles in deep water (Norman), the Hebrides (Norman), from there southwards on the coasts of Great Britain and Ireland (various authors); further, at Holland (Hoek), various places in the North Sea (Metzger); Skager Rak, Kattegat, within the northern part of the Sound in depths from 6½ to 50 fm. (Meinert); also, Bohuslän (Goës), south and west coast of Norway to Lofoten (G. O. Sars), western Finmark (Birula, Appellöf), western part of the Murman south coast to the entrance to the White Sea, 61—67 fm. (Birula) and 35 fm. (Doflein); lastly, in the western half of the White Sea especially in Onega Bay in 4—9 fm. (Birula). — It is thus a markedly boreal species which lives in depths from but a few fathoms down to almost 100 fm.

Remarks. I agree with the view accepted by Norman, G. O. Sars and some other authors that *C. Allmani* is an independent species. The largest specimen I have seen is 63 mm. long; it has come either from Iceland or the Færoes.

39. Cheraphilus neglectus G. O. Sars.

1882. Cheraphilus neglectus G. O. Sars, Overs. Vid. Selsk. Forh. Christiania f. 1882, Nr. 18, p. 45, Tab. I, Fig. 6.

Occurrence. The "Ingolf" has not taken this species, but it has been several times found of recent years at Iceland and the Færoes.

South coast of Iceland: West of Geirfugleskjær, Young-fish trawl, 100 m. wire out, "Thor" 1904; great quantity, very small spec.

South coast of Iceland: 63° 27′ N. L., 19° 37′ W. L., 45 fm., "Thor" 1904; 8 spec.
— — - — 63° 42′ — 17° 34′ — 48—37 fm., "Thor" 1903; 6 spec.
— — - — 63° 42′ — 16° 32′ — 29—25 — "Thor" 1903; 1 —
— — - — 63° 50′ — 16° 31′ — 31 fm., "Thor" 1904; 1 spec.

Distribution. G. O. Sars writes that this species occurs on the south and west coasts of Norway in 2 to 6 fm.; it has been taken later in the Moray Firth, 7—8 fm., and the Firth of Forth (Th. Scott) and west of Ireland, 15 fm. (Walker). It has of course a much wider distribution.

Remarks. Several of my specimens are adult females with eggs, but they are only 14—16 mm. long, thus considerably smaller than the measurement given by Sars, 26 mm. I have compared my specimens with a 19 mm. long, considerably plumper and egg-bearing female of *Ch. neglectus* kindly lent me by Prof. G. O. Sars, and thus made certain that the last-named and my specimens belonged to the same species. Both his female and my specimens differ however from Sars' description in that the carapace and abdomen are not smooth; the carapace has always a considerable number of very small raised granules, the abdomen has in part some depressed 2 points, in part and chiefly laterally some extremely small raised granules, but these are nevertheless much weaker than in *Ch. nanus* Kr. Both the specimen received from Sars and mine differ from *Ch. nanus* in that the end of the rostrum is somewhat broadly rounded, whilst in *Ch. nanus* this is somewhat prolonged; further, in the latter form the integuments are much more granulous with more developed posterior median spine and more distinct rudiments of sublateral keels on the carapace. On the other hand, the other characters given by Sars do not seem reliable: the antennular peduncles are scarcely shorter in *Ch. nanus* than in *Ch. neglectus,* and I have not been able to find keels on the 6th abdominal segment in Danish specimens of *Ch. nanus.* There is also no dark cross-band on the 4th abdominal segment in my specimens of *Ch. neglectus.* — I am not at all certain that *Ch. neglectus* Sars is a species distinct from *Ch. nanus* Kr.; it seems to me not altogether improbable that investigation of a larger material from different localities will show, that *Ch. neglectus* is only a smoother variety. But I accept it here as a species nevertheless, as my material of *Ch. nanus* is too small to settle the question.[1]

40. Sclerocrangon boreas Phipps.

1774. Cancer Boreas Phipps, Voy. towards the North Pole, p. 190, Tab. XII, fig. 1.
! 1842. — — Krøyer, Naturh. Tidsskr., B. IV, p. 218, Tab. IX, Fig. 1—14.

[1] A long time after this text was written Appellöf published his important paper: Die Dekapoden Crustaceen, 1906. On pag. 130 he is inclined to think, that *Ch. neglectus* G. O. S. must be cancelled, and he refers it with a query as a synonym to *Ch. bispinosus* Hailst., while *Ch. nanus* Kr. is considered a synonym to the last-named form.

Occurrence. This species was taken by the "Ingolf" at 5 places:

Baffins Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 8 spec.

Davis Straits: St. 29: 65° 34′ N. L., 54° 31′ W. L., 68 fm., temp. 0·2°; 1 spec.

— - 34: 65° 17′ — 54° 17′ — 55 — — 0·9°; 5 —

North-West Iceland: Dyre Fjord; 3 spec.

North of Iceland: St. 127: 66° 33′ N. L., 20° 05′ W. L., 44 fm., temp. 5·6°; 2 spec.

In Malac. Groenl. I have mentioned a very large number of localities for this species: it goes northward to Discovery Bay at 81° 44′ N. L. and is uniformly distributed along the west coast of Greenland from Cape York to Cape Farewell; it was taken at all depths from ca. 5 fm. to 118 fm., but a single occurrence at 200 fm. must (for reasons given) be considered as less certain. Since that paper was written I have seen many specimens from various localities at West Greenland, but neither these nor the data published by Ortmann and Ohlin increase our knowledge of the bathymetric or geographical distribution of the species. From the east coast of Greenland I gave it in 1895 as taken in Hekla harbour at 70° 27′ N. L. in 1—3 fm., 10 fm., and 7—17 fm.; Ohlin gives it from 74° 10′ N. L. near Clavering Island, 13—21 fm.; later, I have seen specimens from the following East Greenland localities: Angmagsalik, 65° 37′ N. L., many specimens; 69° 44′ N. L., 23° 30′ W. L. in the eel-seine in 3—0 fm., many specimens; Cape Tobin, 70° 23′ N. L., 22° W. L., 57 fm., 2 specimens; Forsblad Fjord, 72° 27′ N. L., 25° 28′ W. L., 90—50 fm., 1 specimen; Sabine Island, 74° 30′ N. L., 18° 45′ W. L., anchorage, 3 specimens. Buchholz had already given it from Sabine Island, 10—20 and 27 fm., and from Jackson Island (73° 34′ N. L.); Koelbel notes it from Jan Mayen. Further, I have seen a number of specimens from the west, north and east coasts of Iceland, but none from the very south, which however is certainly accidental as it is common at the Færoes, having been taken in Vaag Fjord, Tveraa, Trangisvaag, Svinø, Kvannesund, Vestmanhavn and off Nolsø; the depths were from 1—3 fm. and down to 100 fm.

Distribution. It cannot yet be settled if the species is circumpolar. At Norway it is found at Lofoten and Finmark (G. O. Sars), from there eastward in the Murman Sea, the White Sea (Birula) and in the Kara Sea, 43—72 fm. (Ruijs), to the south-west coast of Nova Zembla (Hansen); it has been taken in the Barents Sea in 140 fm. (Hoek) and is known also from Franz Joseph Land (Scott) and is common at Spitzbergen (several authors). It occurs, as mentioned above, at Grinnell Land, also at Labrador and southward along the east coast of America to Cape Cod, 5—36 fm. (S. I. Smith). It has further been taken almost midway on the north coast of Alaska, in the Behring Straits, along the west side of Alaska, at the Aleutians and north-eastern Siberia (Mary Rathbun, 1904); its occurrence at California, Kamtschatka and north of the most eastern part of Asia as given by Owen, Ross, Stuxberg I consider unreliable. Further, Brandt's statement of its occurrence in the Siberian Polar Sea requires confirmation, and as it is far from common in the Kara Sea it is until further information is forthcoming uncertain whether it is absent or not along the 120 degrees of latitude north of Asia. — The greatest depth at which the species has been found with certainty is 140 fm. (Hoek).

Remarks. The largest specimen is from West Greenland and measures 137 mm. from the tip of the rostrum to the end of the telson.

41. Sclerocrangon ferox G. O. Sars.

1877. Cheraphilus ferox, G. O. Sars, Arch. f. Math. og Naturv., B. II, p. 239.
1882. — — Hoek, Nied. Arch. f. Zool., Supplb. I, p. 9, Taf. I, Fig. 3.
! 1885. Sclerocrangon salebrosus, G. O. Sars, Norske Nordhavs-Exped., Crust. I, p. 15, Pl. II.
1887. — ferox, H. J. Hansen, Dijmphna-Togt. zool.-bot. Udb., p. 236.

Occurrence. The "Ingolf" has taken this species at two stations.

South of Jan Mayen: St. 116: 70° 05′ N. L., 8° 26′ W. L., 371 fm., temp. ÷ 0·4°; 3 spec.

North of the Færoes: - 143: 62° 58′ — 7° 09′ — 388 — — ÷ 0·4°; 4 —

In Malac. Groenl. I have mentioned it from 4 localities in Baffins Bay; the most northerly and deepest of these was 75° 26′ N. B., 260 fm. It was taken by the 2nd Amdrup Expedition in the northern part of East Greenland at two places: Fleming Inlet, 71° 51′ N. L., 22° 27′ W. L., 118 fm., red clay, 4 specimens, and Forsblad Fjord, 72° 27′ N. L., 25° 28′ W. L., 90—50 fm., clay with stones and gravel, 2 specimens. One specimen was taken by the Ryder Expedition at 74° 17′ N. L., 15° 20′ W. L., 127 fm., muddy bottom with small stones. Ohlin gives a number of localities along the same part of East Greenland in ca. 50 to 150 fm. At Jan Mayen it was taken in 143 fm. (Koelbel).

Distribution. The species has been taken N. E. of the Shetlands at 62° 15′ N. L., 0° 37′ E. L., 356 fm. (Ohlin); off the west coast of Norway: 63° 10′ N. L., 5° 0′ E. L., 417 fm., temp. ÷ 1·0° (G. O. Sars); Jan Mayen, 95 fm., temp. ÷ 0·6° (G. O. Sars); in the waters of Spitzbergen at a number of localities, in depths from ca. 50 fm. down to 532 fm. (Sars, Ohlin, Doflein, Birula), whilst the temperature is stated to vary between + 2° and ÷ 1·71°; the most northerly of these places was north of Spitzbergen at 81° 20′ N. L. (Doflein). It has also been taken in the northern part of the Murman Sea (Birula), in the Barents Sea (Hoek, Stebbing) and it is common in the Kara Sea in 49—91 fm. (Hansen), but it is not known further to the east.

In the Bih. K. Sv. Vet.-Akad. Handl. B. 27, Afd. IV, No. 8, Ohlin (p. 28—29) discusses in detail the distribution of this species with regard to depth and temperature in comparison with *Scl. boreas*. *Scl. ferox* does not go into shallower water than ca. 50 fm. and is most often met with in depths from 100 to 400 fm.; its frequency in the Kara Sea and occurrence in the cold area of the Norwegian Sea shows that it is a typically arctic species; it has been taken seven times in places with the bottom temperature above 0° (from 0·3° to 2°) and thirteen times where the temperature at the bottom was negative (from ÷ 0·1° to ÷ 1·7°) (Birula). *Scl. boreas* does not occur in the Kara Sea or in the cold area mentioned and has not been taken with certainty in deeper water than 140 fm., whilst it is common in much shallower water even into 3—0 fm. It has never as yet been taken with the other species.

Remarks. The largest Greenland specimen is from Forsblad Fjord; it is 128 mm. long; the largest specimen from the Kara Sea is 130 mm.

42. Nectocrangon lar Owen.

1838. Crangon lar Owen, Zool. of Capt. Beecheys Voy., p. 88, Pl. XXVIII, fig. 1.
! 1842. Argis lar Krøyer, Naturh. Tidsskr., B. IV, p. 255, Tab. V, Fig. 45—62.
1904. Nectocrangon lar M. Rathbun, Harriman Alaska Exped., p. 137, with figs.
1904. — dentata M. Rathbun, Harriman Alaska Exped., p. 138, with figs.

Occurrence. The "Ingolf" has taken this species at 4 stations:

Baffins Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 4 spec.

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 1 spec.

— — - 29: 65° 34′ — 54° 31′ — 68 — — 0·2°; 4 —

— — - 26: 63° 57′ — 52° 41′ — 34 — — 0·6°; 1 —

In Malac. Groenl. I have given a large number of localities along the west coast of Greenland from 72° 23′ N. L. to 60° 43′ N. L.; later, Ortmann has given some places in Smith Sound, the most northerly at ca. 79° N. L. On the east side of Greenland it has been taken at: Angmagsalik (ca. 65½° N. L.), 9—0 fm., in the eel-seine, 8 specimens (Amdrup Expedition); Cape Tobin, 70° 23′ N. L., 22° W. L., 57 fm., clay with stones, 2 specimens (Amdrup Exp.); Hekla Harbour in Scoresby Sound, 70° 27′ N. L., 26° 12′ W. L., 5 specimens (Ryder Exp,); Forsblad Fjord, 72° 27′ N. L., 25° 28′ W. L., 90—50 fm., clay with stones and gravel, 1 specimen (Amdrup Exp.); it is also given from two East Greenland localities: Kaiser Franz Joseph Fjord, 117 fm., clay, and 72° 45′ N. L., 22° 58′ W. L., 18—32 fm., clay (Ohlin). It has not been found at Iceland.

Distribution. On the east coast of North America the species begins at about 43° N. L. a little south of Nova Scotia; off this peninsula it was taken in depths between 26 and 59 fm.; from there it goes north to the St. Lawrence estuary, Newfoundland and Labrador (S. I. Smith). It has also been taken at Point Barrow on the western part of the north coast of North America (Murdoch), at the north east corner of Asia (Stuxberg), through Behring Straits and Bering Sea along Alaska southwards to 56⅕° N. L., along the coast of Asia at Kamtschatka, in the Sea of Ochotsk and at the Kuriles, 6—47 fm. (Mary Rathbun); finally, it is given from Vancouver Island, which lies at 50° N. L. to the north of California (Smith).

The description I gave in Malac. Groenl. p. 38 of the bathymetric occurrence etc. of the species agrees exactly with the observations to hand; it was as follows: "It is already met with in 4—8 fm., most frequently in 15—20 fm., but is nevertheless not rare in 100—120 fm. It has not been found in greater depths than 120 fm. It is often found on muddy bottom, but is not rare on algal grounds, stones or sand."

Remarks. Smith states (Rep. Progr. Geol. Survey Canada 1878—79, p. 212 B), that his specimens from Vancouver Island differ from the Atlantic specimens in several small respects; Holmes (Occas. Papers Calif. Ac. Sc. VII, 1900, p. 178) says that a specimen from Alaska agrees exactly with specimens from the Atlantic, but that specimens taken between Alaska and Vancouver Island formed a transition between specimens from the last-named island and from the Atlantic. Ohlin gives the largest specimen as 95 mm., two specimens from Angmagsalik and Forsblad Fjord are 92 mm.; one of the largest specimens from West Greenland is 85 mm.

In 1902 Miss Rathbun founded a new species, *N. dentata* which, according to her description given in 1904, differs from *N. lar* in two characteristics, to which a third difference may be added according to her figures, namely, the form of the antennal squama. She says regarding *N. dentata* that it is "very closely allied" to *N. lar,* "it differs chiefly in the carina of the sixth abdominal segment terminating posteriorly in a small sharp tooth or spine". Though it is not expressly stated in her diagnosis of *N. lar,* this "tooth or spine" should be absent in this species. An investigation of

my material of *N. lar,* amongst which are Krøyer's type-specimens, has shown me that the carina mentioned ends in a right-angled or pointed tooth sharp to the touch. I find that my *N. lar* in the form of the posterior edge of the carina, in the slender form of the 1st thoracic hand, but not in the form of the squama, agrees better with *N. dentata* Rathb. than with *N. lar* sens. Rathbun. And I believe that *N. lar* Kr. is identical not only with *N. dentata* Rathb. but likewise with *N. lar* sens. Rathb., and that future investigations will come to the same conclusion as mine, namely, that Miss Rathbun's two species cannot be separated from one another. According to the founder, the *N. dentata* has almost precisely the same geographical distribution as her *N. lar,* but is found in from 6 to 96 fm.; she also ascribes specimens from Granville Bay (between 76° and 79° N. L.) on the west coast of Greenland to *N. dentata.* I have mentioned the whole question in such detail, because the literature thus gives a *Nectocrangon dentata* as occurring at West Greenland, which belongs to the area dealt with in this paper.

43. **Sabinea hystrix** A. M.-Edw.

1881. Paracrangon hystrix A. Milne-Edwards, Ann. Sc. Nat., 6. Sér.. Zool., T. XI, p. 6.

! 1882. Sabinea princeps S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, p. 38, Pl. VIII, figs. 1—1 b.

Occurrence. The "Ingolf" has taken this beautiful form at 3 stations.

Davis Straits: St. 28: 65° 14′ N. L., 55° 42′ W. L., 420 fm., temp. 3·5°; 1 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 4 —

South-West of Iceland: St. 83: 62° 25′ N. L., 28° 30′ W. L., 1912 fm., temp. 3·5°; 1 spec.

Distribution. Previously the species was only known from Guadeloupe, 734 fm., and off the east coast of America between 35° 45′ N. L. and 41° 53′ N. L. in depths from 353—888 fm. The distribution of this Atlantic form far up in the Davis Straits is interesting.

Remarks. The largest specimen, a fine female with eggs, is 114 mm. and was taken at St. 27.

44. **Sabinea Sarsii** Smith.

1879. Sabinea Sarsii S. I. Smith, Trans. Conn. Acad., Vol. V, p. 59, Pl. XI. figs. 6—8.

1886. ! — — — Rep. Comm. Fish and Fisher. f. 1885, Pl. X, figs. 3, 3 a, 4.

Occurrence. Has been taken by the "Ingolf" at 3 stations:

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 14 spec.

West of North Iceland: St. 15: 66° 18′ N. L., 25° 59′ W. L., 330 fm., temp. ÷ 0·75°; 3 spec.

North of the Færoes: St. 143: 62° 58′ — 7° 09′ — 388 — — ÷ 0·4°; 1 —

In Malac. Groenl. this species is mentioned from two localities in the Davis Straits; later, I have obtained it from three others (apart from the "Ingolf"); a resumé of my knowledge of its occurrence in the waters mentioned would read as follows: it is taken between 66½° and 63½° N. L. in depths from 67 to 140 fm. I have further seen specimens from the following localities;

Northern Iceland: Skagestrandsbugten, 119 fm., temp. 2·9°, mud, Wandel; 1 spec.

— — 66° 17′ N. L., 18° 13′ W. L., 50 fm., mud, "Thor" 1903; 1 spec.

West of Iceland: 66° 20′ — 25° 12′ — 96 fm., temp. 6·5°; mud, "Thor" 1903; 4 spec.

West of Iceland: 65° 16′ N. L., 25° 20′ W. L., 287 fm., mud, "Thor" 1903; 3 spec.

South of Iceland: 63° 35′ N. L., 21° 38′ W. L., 80 fm., temp. ?; mud, "Thor" 1903; 1 spec.

South-East coast of Iceland: 3—4 miles from land, Dr. Jørgensen; 1 spec.

East of Iceland: 64° 16′ N. L., 11° 15′ W. L., 198 fm., Wandel; 1 spec.

East of south end of Færoes: 61° 23′ N. L., 5° 04′ W. L., 255 fm., temp. 0°, Wandel; 3 spec.

Distribution. It may be probable that the specimen noted by Norman from the Shetland Isles as *S. septemcarinata* in reality belongs to *S. Sarsii*. Specimens have been taken in the Skager Rak north of the Skaw, 70 fm., by Dr. Joh. Petersen, and off the south coast of Norway, 60—80 fm. (Appellöf). Sars writes that the species "occurs not so very rarely on our west coast (f. inst. Christianssund) and goes south to Stavanger [ca. 59° N. L.]". It is also found at East Finmark (Norman), at the western part of the coasts of the Murman Sea as far as to the entrance to the White Sea, 40 to 178 fm. (Birula), lastly, on the east coast of North America in the Gulf of Maine in 60 to 183 fm. (Smith) and south of Halifax, Nova Scotia (Bate).

Sab. Sarsii thus occurs in 40 to 388 fm. and in temperatures on both sides of 0°, but its absence at East Greenland, Franz Joseph Land, in the Kara Sea etc. shows that it is not so distinctly an arctic species as *S. septemcarinata*. In the western part of the Murman Sea both species are found together (Birula); in the waters about Iceland and in the Davis Straits they have not once been taken together; further, *S. Sarsii* goes deeper down than *S. septemcarinata* and is not found in so shallow water as this.

45. **Sabinea septemcarinata** Sab.

1824. Crangon septemcarinatus Sabine, Suppl. to the App. to Parry's Voy. 1819—20, p. CCXXXVI, Pl. II, figs. 11—13.

! 1842. Sabinea septemcarinata Krøyer, Nat. Tidsskr., B. IV, p. 244, Tab. IV, Fig. 34—40, og Tab. V, Fig. 41—44.

! 1879. — — S. I. Smith, Trans. Conn. Acad., Vol. V, p. 57, Pl. XI, figs. 5 og 9—13.

Occurrence. The "Ingolf" has not taken this species.

In the waters on the west coast of Greenland this species goes as far up as Discovery Bay at Grinnell Land, 81° 44′ N. L., 25 fm. (Miers); on the tract from $79^2/_3°$ to 72° N. L. it has been taken many times in 5—20 fm. and down to ca. 45 fm. (Miers, Hansen, Ortmann, Ohlin), and it is noted from 100 fm. in Melville Bay (Mc Clintock). On the west coast of Greenland it is rare south of 72° N. L.: two specimens have been taken at Godhavn and Jakobshavn, several specimens in the stomachs of cod at Ivigtut.

It was taken in northern East Greenland by the 2nd Amdrup Exped. at 6 localities lying between 69° 44′ N. L. and $74^1/_2°$ N. L., at one of these it was taken in the eel-seine in 7—0 fm.; on the East Greenland coast between 70° 27′ N. L. and 74° 35′ N. L. it has been taken a number of times by Swedish Zoologists, and the depth at one of these stations was ca. 160 fm. (Ohlin). — Near Jan Mayen one specimen was taken in 50—60 fm. (2nd Amdrup Exped.).

At Iceland it has been taken chiefly in the fjords along the east coast (Mid, Seydis, Nord, Røde, Faskrud and Beru Fjords), where *S. Sarsii* does not occur, at depths between 20 and 80 fm.;

on the north-west coast also it has been taken in Patriks Fjord and Arnar Fjord in 20 to 50 fm.; on the north coast several times in Skálfandi and once in 110 fm.

Distribution. Norman notes the species from the Shetland Isles, but it is not improbable that there was confusion with the later established *S. Sarsii.* In 1890 Sars writes that this species is found on the west coast of Norway, it occurs at Lofoten and according to his account must go much further south, though he does not mention the limit. It is also found on the western and eastern coasts of Finmark (Sparre-Schneider and Norman), in the whole of the Murman Sea and in the White Sea (Birula); further in the Barents Sea (Hoek, Stebbing), is frequent at Spitzbergen right up to 81° 14′ N. L. at all depths between 5—8 fm. and down to 133 fm. (Ohlin, Doflein, Birula); it is common in the Kara Sea in 10 to 100 fm. (Stuxberg, Hansen), has been taken in the Siberian Polar Sea at 115½ E. L. and 170° 17′ E. L. (Stuxberg). On the east coast of North America it goes south to Massachusetts Bay, ca. 42⅓° N. L., and it has been taken at a number of localities from there to the St. Lawrence estuary in 15 and down to 70 fm. (Smith, M. Rathbun). It is not found in the Behring Straits and north of the American continent — i. e. between ca. 180° and 80° W. L. The species has been taken in 7—0 fm. and down to ca. 180 fm.; it is a pronouncedly arctic form.

Remarks. Ohlin (Bih. K. Sv. Vet. Akad. Handl. B. 27, Afd. IV, No. 8, p. 37) has already mentioned the superficial remark of Doflein's in "Fauna Arctica" that *Sab. Sarsii* is a variety of *S. septemcarinata;* Doflein has probably never seen *S. Sarsii.* Ohlin also mentions the *S. septemcarinata* described and figured by Bate in the "Challenger" Macrura; Bate says that his specimens agree most closely with Smith's *S. Sarsii,* which he considers as a "pronounced variety". This last opinion is incorrect; I have never seen any specimens which in regard to the form of the rostrum were intermediate between *S. Sarsii* and *S. septemcarinata;* also, there are very interesting differences in the geographical and bathymetrical distribution of the two species. The largest Icelandic specimen, a female with eggs, is from Beru Fjord and measures 76 mm.; from 70° 48′ N. L. comes the largest East Greenland specimen, likewise a female with eggs, 81·5 mm.; the largest specimen from the Kara Sea was 82·5 mm.

46. **Pontophilus norvegicus** M. Sars.

1861. Crangon norvegicus M. Sars, Nyt Mag. f. Naturv., B. 11, p. 248.

! 1868. Pontophilus — M. Sars, Nyt Mag. f. Naturv., B. 15, p. 242, Tab. I, Fig. 1—25, Tab. II, Fig. 17—37.

Occurrence. The "Ingolf" has brought home this species from many stations:

Davis Straits: St. 32: 66° 35′ N. L., 56° 38′ W. L., 318 fm., temp. 3·9°; 20 spec.
— — - 35: 65° 16′ — 55° 05′ — 362 — — 3·6°; 4 —[1]
— — - 28; 65° 14′ — 55° 42′ — 420 — — 3·5°; 2 —
— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 50 —
— — - 25: 63° 30′ — 54° 25′ — 582 — — 3·3°; 2 —

West of Iceland: St. 97: 65° 28′ N. L., 27° 39′ W. L., 450 fm., temp. 5·5°; 2 spec.
— - — - 90: 64° 45′ — 29° 06′ — 568 — — 4·4°; 1 —

[1] These two specimens possibly do not belong to this station but to St. 27.

West of Iceland: St. 89: 64° 45′ N. L., 27° 20′ W. L., 310 fm., temp. 8·4°; 1 spec.
— - — - 9: 64° 18′ — 27° 00′ — 295 — — 5·8°; 7 —
South-West of Iceland: St. 81: 61° 44′ N. L., 27° 00′ W. L., 485 fm., temp. 6·1°; 5 spec.
— - — - 73: 62° 58′ — 23° 28′ — 486 — — 5·5°; 2 —
South of Iceland: St. 69: 62° 40′ N. L., 22° 17′ W. L., 589 fm., temp. 3·9°; 1 spec.

From St. 101: 66° 23′ N. L., 12° 05′ W. L., 537 fm., temp. ÷ 0·7°, that is, east of northern Iceland in the cold area, a single specimen is to hand, but as it seems to have been dried, I can say with reasonable certainty that it has not been taken at the locality, with negative bottom-temperature, from which it is given.

It seems appropriate with this species to mention all its other localities within the seas mentioned.

Davis Straits: 66° 49′ N. L., 56° 28′ W. L., 235 fm., temp. 4·4°, sand and mud, Wandel; 3 spec.
— — 65° 36′ — 56° 24′ — 349 — — 3·2°, clay and mud, — 1 —
— — 65° 35′ — 54° 50′ — 80 — stones without algæ, Th. Holm; 2 spec.
South of Iceland: 63° 15′ N. L., 22° 23′ W. L., 115—170 fm., "Thor" 1903; many spec.
— - — 63° 16′ — 19° 57′ — 150—200 — — 1903; several spec.
North-West of the Færoes: 63° 15′ N. L., 9° 35′ W. L., 270 fm., Wandel; 1 spec.
South-West - — 61° 15′ — 9° 35′ — c. 500 fm., "Thor" 1904; 7 spec.
— - — 61° 08′ — 9° 28′ — 450 — — 1904; 1 —
South-East - — 61° 22′ — 5° 04′ — 255 — temp. 0°, ooze, Wandel; 1 spec.
Between the Færoes and the Hebrides: 59° 28′ N. L., 8° 1′ W. L., 687—580 fm., "Michael Sars" 1902; 1 spec.

Distribution. This species has been taken at a number of places in the Skager Rak at a greater or less distance from the Skaw, in 55 to 275 fm. (material collected by Dr. Joh. Petersen), also at Bohuslän (Goës), in the deep fjords along the whole coast of Norway from Christiania Fjord to Varanger Fjord in depths from 30—60 fm. (M. Sars) to 672 fm. (G. O. Sars) and always in positive bottom-temperatures (2·8°—6·7° C.), also off the west coast of Norway and north of this between 72° and 73° N. L. (1·5°—6·9°), further, up towards Spitzbergen at 75° 58′ N. L., 13° 18′ E. L., 186 fm., temp. 2·7° (Ohlin); lastly in the most westerly part of the Murman Sea, but not near to the White Sea (Birula). In the Bay of Gascony the species has been taken in 425 and 638 fm. (Caullery). Off the east coast of North America it goes from Cape Halifax (ca. 44° N. L.) to ca. 38° 37′ N. L. from 94 fm. and downwards to 524 fm. (S. I. Smith).

Both G. O. Sars and Ohlin consider it to be "in all probability" of arctic origin. Of this I know nothing, but it is certain that it is not an arctic form. Although it is usually met with in 200—500 fm., but can go in to 30—60 fm. and down to at least 672 fm., it has never been taken in negative bottom-temperatures; only once it is given from 0°, but the locality lies in the Færoe Channel where an error in the temperature may easily have arisen on account of the bottom, the temperature being taken at a place with 0° but the animal in reality at some distance at a place with positive temperature. The lowest certain observation among the numerous temperatures is 1·5°, but at most places it measured between 3° and 7°. The occurrence of this species up to almost 76° N. L. and yet living everywhere in positive bottom-temperatures is interesting; with this its occurrence in the Bay of Gascony also agrees, the latter further showing sufficiently that the species is not arctic.

47. **Pontophilus spinosus** Leach.

1815. Crangon spinosus Leach, Trans. Linn. Soc London, Vol. XI, p. 346.
1853. — — Bell, Brit. Stalk-eyed Crust. p. 261 (with figures).
1866. — — Heller, Crust. Südl. Europa, p. 229, Taf. VII, Fig. 16.
! 1868. Pontophilus spinosus M. Sars, Nyt Mag. f. Naturv. B. 15, p. 24, Tab. 2, Fig. 38—45, Tab. 3, Fig. 46, 47.

Occurrence. The "Ingolf" has not found this species. But in 1903 and 1904 two specimens in all were taken south of the south-west part of Iceland:

63° 15′ N. L., 22° 23′ W. L., 114—173 fm.; 1 spec.

West of Geirfugleskjær; young-fish trawl, 100 m. wire out; 1 extremely small spec., taken pelagically.

Distribution. The species, which is not known from the Færoes, is common at the Shetland Isles (Norman), is also found at the Hebrides (Norman) and further to the south on the coasts of Great Britain and Ireland, at the Channel Islands (Norman), it is also taken in the Bay of Gascony, 220 fm. (Caullery), and at a number of places spread over almost the whole of the Mediterranean, in depths from ca. 50 to 830 fm. (several authors). In Denmark it has been taken in the eastern Kattegat at depths from 22 to 55 fm. (Meinert), also at Bohuslän (Goës); along the south and west coasts of Norway from Christiania to Christianssund in 30—60 fm. (M. Sars).

48. **Glyphocrangon sculptus** Smith.

! 1882. Rhachocaris sculpta S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, p. 49, Pl. V, fig. 3, Pl. VI, figs. 3—3d.
1884. Glyphocrangon sculptus S. I. Smith, Rep. Comm. Fish and Fisher. f. 1882, p. 364.
1886. — — S. I. Smith, Rep. Comm. Fish and Fisher. f. 1885, p. 655, Pl. IX, figs. 1—2.

Occurrence. The "Ingolf" has taken this species at a single station.

West of Iceland, in the middle of the Denmark Straits: St. 11: 64° 34′ N. L., 31° 12′ W. L., 1300 fm., temp. 1·6°; 1 spec.

Distribution. The species has hitherto only been known from some stations off the east coast of North America between 41° 10′ N. L. and 37° 50′ N. L., in depths from 1098 to 1395 fm. (S. I. Smith); quite recently it is noted from South Africa, not far from Cape Point, 750—800 fm. (Stebbing).

Remarks. The single specimen, a female, is 100 mm. long.

49. **Hippolyte varians** Leach.

1815. Hippolyte varians Leach, Malac. Pod. Brit., Pl. 38, figs. 6—16.
! 1842. — smaragdina Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Deel, p. 271, Tab. I, Fig. 1—11.
1853. — varians Bell, Brit. Stalk-eyed Crust., p. 286, with figs.
! 1863. — — Heller, Crust. südl. Eur., p. 288, Taf. X, Fig. 4.

Occurrence. This species has not been brought home by the "Ingolf". It has been taken several times at the Færoes, thus at Thorshavn, Tværaa, Vestmannhavn, in Trangisvaag, 1—3 fm. and in Ande Fjord, 16—24 fm.

Distribution. The species is known from the Shetland Isles and the Hebrides (Norman); it is common at Great Britain and Ireland (various authors), it is also found at the Channel Islands (Norman), on the west coast of France (Bonnier), in the western part of the Mediterranean and in the Adriatic (Heller). It also occurs at Holland (Hoek); it goes far into the Kattegat, a little into the Sound (Meinert) and is found at Bohuslän (Goës). Concerning *H. fasciger* Gosse, which is identical with *H. varians,* Sars writes: "it occurs along the whole of our south and west coasts, but does not seem to reach up into the arctic region"; Sp. Schneider does not give *H. varians* from the fjords investigated by him lying between 69½° and 70° N. L.

The species lives in depths from quite a few fathoms out to ca. 50 fm.

50. Spirontocaris Fabricii Kr.

1841. Hippolyte Fabricii Krøyer, Nat. Tidsskr., 3. B., p. 571.

! 1842. — — Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Deel, p. 277, Tab. I, Fig. 12—20.

1879. — — S. I. Smith, Trans. Conn. Acad., Vol. V, p. 63.

1891. Helia fabricii J. Thallwitz, Decapoden-Studien, p. 24.

Occurrence. The "Ingolf" has taken this species at the following place:

West Greenland: Ameragdla (Head of Ameralik Fjord, Godthaab); 1 spec.

In Malac. Groenl. I mentioned a large number of localities for this species from West Greenland between 72° 23′ N. L. and 60° 43′ N. L.; it is common from 2—5 fm. and out in ca. 45 fm.; once it was taken in 65 fm., while a note of its occurrence in 100 fm. (at Sukkertoppen) must be considered provisionally as doubtful. Since 1888 the Zoological Museum has received numerous specimens from the same coast but none of the localities offer any interest. — At East Greenland the species seems to be absent; in the Zoological Museum there is a specimen determined by Krøyer labelled "Iceland", but as Krøyer does not mention the locality and the animal has not been found at the island in the last 40 years I am inclined to think that this statement has arisen from some error.

Distribution. It has been taken at 64° 56′ N. L., 66° 18′ W. L., 5—15 fm., a place which lies on the west side of the Davis Straits (Ohlin). It is also given from Labrador, St. Lawrence estuary and along the east coast of America southwards to Cape Cod; the species is common along the tract from Halifax southwards in depths from ca. 5 to 64 fm. (S. I. Smith). Further, it has been taken at Point Franklin on the north-west side of Alaska (Murdoch), and from there southwards "through Bering Sea to Siberia and Alaska Peninsula", "low water to 80 fathoms" (Mary Rathbun), also at Kamtschatka (Richters).

51. Spirontocaris Gaimardii H. M.-Edw.

1837. Hippolyte Gaimardii H. Milne-Edwards, Hist. Nat. Crust., T. II, p. 378.

! 1842. — — Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 282, Tab. I, Fig. 21—29.

1842. — gibba, Krøyer, l. c. p. 288, Tab. I, Fig. 30, og Tab. II, Fig. 31—37.

1891. Euales obses J. Thallwitz, Decapoden-Studien, p. 23.

Occurrence. The "Ingolf" has only met with this common species at a single station.

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 18 spec.

In Malac. Groenl. I have mentioned numerous localities; the furthest north the species has been taken was at Grinnell Land at 79° 29′ N. L. (Miers), and along the west coast of Greenland it goes from Port Foulke (Stimpson) to 61° 50′ N. L.; of the bathymetric distribution I wrote: "This species is found generally in shallow water from ca. 4 fm. and out to 40 fm., but it has also been taken many times at a considerable depth, between 100 and 175 fm.; the observations from 240 and 250 fm. require further confirmation". Later finds, even those of Ortmann and Ohlin from the same region, have added nothing new worth mentioning to my earlier statements.

On the east side of Greenland the species has been taken at Angmagsalik (ca. 65½° N. L.), 9—0 fm., in the eel-seine, half a score of specimens (Amdrup Exp.), also a number of times by Swedish expeditions on the tract from 70° 27′ N. L. to 74° 35′ N. L., in depths from 6½—9 fm. and down to 132 fm. (Ohlin). At Jan Mayen, from which Koelbel had already noted it, two specimens were taken at 55 fm. (2nd Amdrup Exp.). At Iceland it has been taken a number of times along the whole of the west side, in almost all the fjords of the east coast and in Skagestrand Bay on the north coast, the depths being 0—2 fm. and out to 50 fm.; at the Færoes it has been taken at various places in a few fathoms water (Trangisvaag, Tveraa, Kolle Fjord, Vaag Fjord, Kvannesund, Skaale Fjord).

Distribution. The species occurs at the Shetlands and the Hebrides (Norman), on the west coast of Scotland at 56° N. L. (Bell) and in the Firth of Forth (Th. Scott). It is common in the Kattegat in ca. 2—12 fm., penetrates to the Sound and through the Belts into Kiel Bay and adjacent waters (Meinert, Möbius). It is found at Bohuslän (Goës), along the whole coast of Norway (M. Sars), on the coast of the Murman Sea and in the White Sea (Birula), in the Barents Sea (Hoek), at Spitzbergen (Krøyer, G. O. Sars etc.) and Franz Joseph Land (Scott), in the Kara Sea in 10—100 fm. (Hansen) and at the north-west corner of Asia. On the east coast of America it goes as far south as Boston, from there northwards it is found along the coast and is common at Labrador (S. I. Smith). It has been taken on the north side of Alaska at Point Franklin (Murdoch); also in Bering Straits and the Bering Sea both on the north east coast of Siberia and along the west coast of America southwards to 57° N. L., 3½ to 52 fm. (Mary Rathbun). Specimens from more southerly localities on the west coast of America were in 1904 referred by Mary Rathbun to new species.

The above data will have shown the main points in the bathymetric distribution of the species; it is commonest from some few to ca. 50 fm., has been taken several times at 100 to 175 fm., but how far the statements of 240 and 250 fm. at West Greenland are correct must remain unsettled. We see from its distribution that it occurs in both positive and negative bottom-temperatures.

Remarks. Almost all authors have united *S. gibba* Kr. with *S. Gaimardii*; most have considered that *S. gibba* was the male, which at certain places or in certain seas obtains the well-known dorsal process on the third abdominal segment. All the specimens of my large material from Denmark, the Færoes and Iceland quite lack the dorsal spine, and are thus typical *S. Gaimardii.* From Angmagsalik in East Greenland I have several large females, all typical *S. Gaimardii,* and 3 much smaller males, all typical *S. gibba.* From most of the localities of West Greenland the specimens of both sexes belonged to *S. Gaimardii;* in Malac. Groenl. I mentioned I had seen some very large

specimens with the dorsal spine, and they all came from 100 to 175 fm. depth in Baffin Bay. Later I have seen several specimens both males and females taken at Egedesminde, which belong to *S. gibba;* one of these was a gigantic female 80·5 mm. long, the abdominal process in which is a thick, pointed, slightly crooked spine. Concerning the numerous specimens from the Kara Sea I wrote in "Dijmphna-Togtet", p. 238: "Practically all the specimens belong to the form *Hipp. gibba* Kr., yet the prominent thickening on the dorsal side of the 3rd abdominal segment is usually much stronger than in Krøyer's specimens and runs out in the females into a small, in the males into a very considerable hook. It may be remarked that some specimens of this species are obviously large, but that the strong development of the dorsal spine on the 3rd abdominal segment is throughout much more characteristic for the representatives of this species from the Kara Sea than the absolute length of the animal". One of the largest females from the Kara Sea measures 74 mm., thus somewhat smaller than the giant from Egedesminde, and the dorsal spine in the latter is equal in size to the largest in the females from the Kara Sea, whereas the dorsal spine in males from the Kara Sea is longer, more slender and more bent than in any specimen from Greenland, though a male from 118 fm. at West Greenland is considerably larger than the same sex from the Kara Sea. Vanhöffen however states that he has had a female with eggs taken in Karajok Fjord which was 103 mm. (he gives lower down 108 mm.) in length.

52. **Spirontocaris spinus** Sow.

1806. Cancer spinus Sowerby, Brit. Miscellany, p. 47, Pl. XXIII.

! 1842. Hippolyte Sowerbei, Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 298, Tab. II, Fig. 45—54.

1882. — spinus, Hoek, Nied. Arch. f. Zool., Supplb. I, Crustaceen, p. 15, Taf. I, Fig. 4—7.

! 1899. — — Birula, Ann. Mus. Zool. de l'Acad. Imp. St.-Pétersbourg, 1899, I, p. 30, Fig. 1.

Occurrence. The "Ingolf" has taken this species at 5 localities:

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 42 spec.

Davis Straits: - 29: 65° 34′ — 54° 31′ — 68 — — 0·2°; 4 —

— — - 34: 65° 17′ — 54° 17′ — 55 — — ?; 15 spec.

North-West coast of Iceland: Dyre Fjord, 1 spec.

North of Iceland: St. 127: 66° 33′ N. L., 20° 05′ W. L., 44 fm., temp. 5·6°; 6 spec.

In Malac. Groenl. I have given a large number of localities for it; the most northerly is 81° 44′ N. L. on Grinnell Land, also along Greenland itself from Cape York to 60° 43′ N. L.; concerning the depth I wrote: "it is not rarely found in shallow water from ca. 4 fm. and outwards, is common and well-developed in 20—50 fm., and has been taken not a few times at a considerable depth, from 80 to 140 fm., but the statements of 200 to 240 fm. require further confirmation". Later observations have not extended this knowledge; Ohlin and Ortmann show, that the species is common between 76° and 79° N. L. in 5 to 45 fm. — At East Greenland one specimen was taken at Angmagsalik (Kruuse and 1st Amdrup Exp.), and it is given from more to the north on this coast, viz. 72° 45′ N. L. and 74½ N. L., in respectively 18—32 fm. and 42—53 fm. (Ohlin). It has been taken at Jan Mayen in ca. 53 fm. (Koelbel).

At Iceland this species has several times been taken on the west side, from Arnarnæs to Reykjavik and Skagi; on the east side it has been found in Mid Fjord, Røde Fjord and Beru Fjord; the depths were from 3 to 52 fm. At the Færoes it has been taken at Thorshavn and several times further out to sea in 30, 60 and 100 fm. (Th. Mortensen).

Distribution. It has been found at Oban, west coast of Scotland, at 56½ N. L. (Norman), and is mentioned from the Irish Sea (Walker)[1]; a single specimen has been taken in the innermost part of the Kattegat at Samsø (Meinert); Goës gives it from Bohuslän, and Appellöf states that he has seen a typical specimen in the Kristineberg collection. In Norway it goes southward at least to ca. 59⅔° N. L., 30—40 fm. (G. O. Sars); and has been taken at Bergen and Christianssund only "at great depths" (Danielssen); it is known from the fjords near Tromsø (Sp. Schneider), but not from East Finmark (Norman), it occurs through the whole of the Murman Sea — is commonest here according to Birula in 40—50 fm., but is found in 4 and down to 175 fm. — and penetrates into the White Sea. It has several times been taken in the Barents Sea in 67 to 124 fm. (Hoek, Stebbing), is common at Spitzbergen (several authors), but on the other hand it has not been taken near Franz Joseph Land, in the Kara Sea nor along the whole of the north coast of Asia. On the east coast of North America it has frequently been taken on the tract from Cape Cod to off Nova Scotia, in depths from 5 to 90 fm. (S. I. Smith, M. Rathbun); it is likewise found in the St. Lawrence estuary (Whiteaves), at Labrador (Packard), on the north side of Alaska, in Bering Straits, the Bering Sea, at the Alaskan Peninsula and at the Aleutian Islands, in 5—91 fm. (Mary Rathbun), at Kamtschatka (Richters), lastly at Queen Charlotte Islands and Vancouver, 50° N. L. (Smith). — How far the species is found on the long tract of 130 degrees along the north coast of Asia is not yet known. The greatest depth from which it is known with certainty is 175 fm., the notices from 200 and 240 fm. I cannot consider absolutely trustworthy. It has been taken in so low a bottom-temperature as ÷ 1·42° (Ohlin), but it also occurs on grounds with low positive temperatures.

Remarks. I have now come to the conclusion that the following species is not a variety of *S. spinus*. The differences will be dealt with under *S. Lilljeborgii*.

53. **Spirontocaris Lilljeborgii** Danielssen.

1859. Hippolyte Lilljeborgii Danielssen, Nyt Magazin for Naturvid. 1861, p. 5 (The title-page of the reprint bears the date of 1859).

1861. — securifrons, Norman, Rep. Brit. Assoc. f. Advanc. Sc.

! 1863. — — Norman, Transact. Tyneside Naturalist's Field Club, 1860—62, Vol. V, p. 267, Pl. XI, figs. 1—2.

! 1873. — Lilljeborgii, Danielssen og A. Boeck, Nyt Mag. for Naturvid. 1873, p. 196, Tab., Fig. 15—20.

1899. — securifrons, Birula, Ann. Mus. Zool. de l'Acad. Imp. St.-Pétersbourg, 1899, I, p. 31, Fig. 2.

Occurrence. The "Ingolf" has brought home this species from two stations:

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 6 spec.

North-West of Iceland: St. 129: 66° 35′ N. L., 23° 47′ W. L., 117 fm., temp. 6·5°; 11 spec.

[1] I agree with Appellöf in his suggestion that Walker probably referred a specimen of *S Lilljeborgii* to *S. spinus*, consequently that *S. spinus* has not been found in the Irish Sea.

I had noted it previously from the Davis Straits: 66° 32′ N. L., 55° 34′ W. L., 100 fm., Th. Holm. It was taken by the "Thor" to the south of Iceland at the following localities:

63° 46′ N. L., 22° 56′ W. L., 80 fm.; large number of specimens.

63° 15′ — 22° 23′ — 114—173 fm.; 1 specimen.

It has not been found at the Færoes.

Distribution. The species is noted by Norman from the Shetlands, Hebrides, Northumberland and Durham, from Firth of Clyde by Henderson; at Denmark it has twice been taken in the Kattegat in 5 fm. and 23 fm. (given by Meinert as *H. spinus*) and has been found a number of times in the Skager Rak in depths from 23 to 106 fm. According to G. O. Sars it is "very common on our (Norway) south and west coasts in great depths"; he gives it also from two places in the sea west of Finmark at 107 and 300 fm.; it is further found at East Finmark (Norman) and in the most westerly part of the south coast of the Murman Sea, in 94 to 159 fm. (Birula). Lastly, the species has been taken a number of times on the east coast of North America from Nova Scotia to 37° N. L., in 25 to 640 fm. (S. I. Smith, Mary Rathbun), also on the north side of Alaska at ca. 157¾ W. L. (M. Rathbun).

Remarks. In 1863 Norman gave a detailed description with 7 figures of this species. He concludes with the following words, which are cited here as the original description is rare in libraries: "*H. securifrons* approaches more nearly to *H. spinus* (Sowerby) than to any other of our recognised species. The latter may be more especially distinguished from the former; first, in having the dentated keel continued to the hinder margin of the carapace; secondly, in the four posterior teeth being of considerably greater size than the teeth anterior to them; thirdly, in the fact that the teeth in the upper margin of the rostrum are themselves furnished with secondary teeth; and fourthly, in having the dorsal centre of the third abdominal segment produced into a conspicuous tooth-like process". Further, Birula has remarked that the thoracic legs are relatively longer in *S. Lilljeborgii* than in *S. spinus*, and if the two posterior pairs are compared in the two species the difference is fairly obvious. As I have seen no transitional forms, I consider *S. Lilljeborgii* to be a true, independent species, which urther may be called boreal and not arctic; it is absent from all the coldest places where *S. spinus* occurs.

54. Spirontocaris macilenta Kr.

1841. Hippolyte macilenta Krøyer, Nat. Tidsskr., 3. B., p. 574.

! 1842. — — Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 305, Tab. II, Fig. 55—56.

1879. — — S. I. Smith, Trans. Conn. Acad., Vol. V., p. 71.

Occurrence. The "Ingolf" has not taken this species.

It is mentioned in Malac. Groenl. that I had up to that time only seen 6 specimens in all, all determined by Krøyer, but not his original specimens; when he wrote his monograph he had only one specimen from Fiskenæsset in south-western Greenland, and it must have been lost. Since 1887 the Copenhagen Museum has received 4 specimens, taken at Jakobshavn by Traustedt. Vanhöffen states that he has taken three specimens in Karajok Fjord (at ca. 70° 20′ N. L.), one of them from over 50 fm. — This species has not been found at East Greenland, Iceland, or the Færoes.

Distribution. The species has several times been taken at Halifax, Nova Scotia, 26 to 57 fm. (S. I. Smith), in the St. Lawrence estuary, 30 to 70 fm. (Whiteaves), at Labrador (Packard), lastly in the Bering Straits, the Bering Sea over towards America and at Kamtschatka and in the Sea of Ochotsk, 16 to 100 fm. (Mary Rathbun).

Remarks. Doflein in "Fauna Arctica" has placed *S. macilenta* Kr. as a synonym to "*H. phippsi* Krøyer"; on the following page (p. 333) under *S. spinus* he writes however: "Betrachte ich aber das gesamte Material, so kan ich so viel Uebergänge zu *H. phippsi* feststellen, insbesonders zu den als *turgida* and *macilenta* von Kröyer als besondere Arten beschriebenen Formen von *phippsi,* dass ich glaube, es handelt sich nur um eine Art, welche dem Prioritätsgesetze gemäss den Namen *H. spinus* Sow. tragen muss. Diese Annahme wird auch durch die ganz gleichartige Verbreitungsweise der fraglichen Species unterstützt". That *H. phippsi* Kr. was the male, *H. turgida* Kr. the female of the same species had been made out many years before Doflein's work, but when he wishes to include *H. turgida* Kr. and *H. macilenta* Kr. under *H. spinus* Sow., that shows great lack of knowledge of his subject and great hardihood. And the support given by the "gleichartige Verbreitungsweise" to the view that there is here only a single species is indeed a broken reed, as the three species have a very different distribution: *S. macilenta* is only known from West Greenland and the waters on each side of the most northerly parts of North America, whilst both the other species are found for example on the northern parts of Europe, further *S. turgida* is certainly more arctic in its distribution than *S. spinus.*

55. Spirontocaris turgida Kr.

1841. Hippolyte turgida Krøyer, Nat. Tidsskr., 3. B., p. 575.
— — Phippsii Krøyer, — — —
1842. — turgida Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 308, Tab. II, Fig. 57—58, Tab. III, Fig. 59—63.
! — — Phippsii Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 314, Tab. III, Fig. 64—68.
1879. — — S. I. Smith, Trans. Conn. Acad., Vol. V, p. 73.

Occurrence. The "Ingolf" has brought home this species from two localities.

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 2 spec.

Davis Straits: The mouth of Ameralik Fjord at Godthaab, 5—70 fm.; 1 spec.

I have given in Malac. Groenl. a large number of localities for this species; the most northerly was at 81° 44′ N. L. at Grinnell Land (Miers), also along Greenland itself from 78° 17′ to 60° 43′ N. L.; the species is stated to be common in from 2—4 fm. and out in ca. 25 fm., it was taken some few times in depths from ca. 50 to 60 fm., but two statements of its occurrence in 100 and 200 fms. at Sukkertoppen I considered "very doubtful", and I believe I am now able to say that 100 fm. is probably correct, 200 fm. certainly incorrect. Later discoveries have not extended this knowledge; Ohlin and Ortmann show that the species is common between 76° and 79° N. L, in 5 to 45 fm. — At East Greenland the species has been taken at Tasiusak, 65° 37′ N. L., 37° 34′ W. L., 5—19 fm. and in the eel-seine, 9—0 fm. (Amdrup Exp. and Kruuse), and at Hekla Harbour in Scoresby Sound, 70° 27′ N. L.,

26° 12′ W. L., 9—11 fm., 6 specimens (Ryder Exp.); Ohlin gives it from 70° 27′ N. L., 22° 35′ W. L. Buchholz notes it from several localities further north (Cape Wynn, Sabine Isl., Shannon Isl. and North Shannon Isl.), from ca. 74° to a little north of 75° N. L. in depths from 5 fm. to 30 fm. and "20—100" fm. It has not been met with at Iceland or the Færoes.

Distribution. In Norway according to G. O. Sars it is "only exceptionally" found south of the Polar Circle, but it is stated nevertheless that a single specimen has been taken at Bohuslän (Goës). It is common at Finmark (M. Sars), from there it goes along the whole coast of the Murman Sea, into the White Sea and is said to have been taken in 145 fm. (Birula); it is also found in the Kara Sea at Nova Zembla (Hansen), at ca. 76¼ N. L., 59 E. L., 16 fm. (Heller), Franz Joseph Land (Scott), and Spitzbergen (several authors). On the east coast of North America it goes south to 41° 30′ N. L., that is, a little to the south of Cape Cod; from here northwards to the St. Lawrence estuary it has been taken in depths from ca. 10 fm. and down to 125 fm. (S. I. Smith); it also occurs at Labrador (Packard jun.), on the north side of Alaska at Point Franklin, 13½ fm. (Murdoch), the Bering Straits, west side of Alaska to Shumagin, also at the Aleutian Isl. (Mary Rathbun), Queen Charlotte Islands, 15—8 fm. (S. I. Smith), northern Japan at Hakodate (Stimpson), Sea of Ochotsk (Brandt), and the most easterly part of the north coast of Asia (Stuxberg).

56. Spirontocaris pusiola Kr.

1841. Hippolyte pusiola Krøyer, Naturh. Tidsskr., 3. B., p. 576.

! 1842. — — Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 319, Tab. III, Fig. 69—75.

1879. — — S. I. Smith, Trans. Conn. Acad., Vol. V, p. 77.

Occurrence. The "Ingolf" has brought this species home from two localities:

West side of Iceland: St. 87: 65° 02′ N. L., 23° 56′ W. L. 110 fm., temp. ?; 2 spec.

North of Iceland: St. 127: 66° 33′ N. L., 20° 05′ W. L., 44 fm., temp. 5·6°; 3 spec.

This small characteristic species is not found at West or East Greenland. At Iceland it has been taken on all four sides of the Island (Vestmannaøer, Reykjavik, Faxe Fjord, Dyre Fjord, Skagestrand Bay, Øfjord, Skjálfandi, Finne Fjord, Seydis Fjord, Faskrud Fjord), in depths from 6 to 119 fm.; it is common at the Færoes (Trangisvaag, Ande Fjord, Kalbak Fjord, Thorshavn and further from land) in ca. 8 to 100 fm.

Distribution. It occurs from the Shetlands and Hebrides (Norman), to Northumberland (Norman) and Norfolk (Metzger), the Irish Sea (Walker), at Jersey (Norman) and west coast of Holland (Metzger). In Denmark the species has been taken in the Great Belt, 24 fm., (Metzger), southern Kattegat (Meinert), Skager Rak (Metzger); also at Bohuslän (Goës), along the coast of Norway (M. Sars), at East Finmark (Norman), on the western part of the Murman coast to the entrance to the White Sea (Birula, Doflein), lastly on the west side of Spitzbergen at 77° 23½′ N. L., 24° 07′ E. L. in 40 fm. (Doflein). On the east coast of America it begins somewhat south of Cape Cod at ca. 41° 10′ N. L. and goes northwards to Nova Scotia and the estuary of St. Lawrence; it is found from 4 fm. or even at the ebb margin out to 50 fm. and 52—90 fm. (Smith). Further, it has been taken at numerous localities in the Bering Islands, the Aleutians and Alaskan peninsula -- i. e. along the south boundary

of the Bering Sea — in depths of 5 to 159 fm. (Mary Rathbun). — The greatest depth at which the species seems to have been taken in Europe is 119 fm. in Skagestrand Bay in Iceland; south of the Alaskan peninsula it was taken in 159 fm.

57. Spirontocaris polaris Sab.[1]

1824. Alpheus polaris Sabine, Suppl. to the App. of Capt. Parry's Voy., p. CCXXXVIII, Pl. II, figs. 5—8.
! 1842. Hippolyte polaris Krøyer, Kgl. D.Vid. Selsk. math.-naturv. Afh., Niende Del, p. 324, Tab. III, Fig. 78—81, Tab. IV, Fig. 82.
! — — borealis Krøyer l. c. p. 330, Tab. III, Fig. 74—77.
1879. — polaris S. I. Smith, Trans. Conn. Acad., Vol. V, p. 80.
1886. — Amazo Pfeffer, Jahrb. wiss. Anst. Hamburg, III, p. 46, Fig. 6 a, 6 b.

Occurrence. The "Ingolf" has taken this species at 12 localities:

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 4 spec.
Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 3 spec.
— — - 32: 66° 35′ — 56° 38′ — 318 — — 3·9°; 1 —
— — - 29: 65° 34′ — 54° 31′ — 68 — — 0·2°; 13
— — - 34: 65° 17′ — 54° 17′ — 55 — — ?; 17 spec.
East of South Greenland: St. 94: 64° 56′ N. L., 36° 19′ W. L., 204 fm., temp. 4·1°; 1 spec.
South-West of Iceland: St. 85: 63° 21′ N. L., 25° 21′ W. L., 170 fm., temp. ?; 1 spec.
North of East Iceland: - 126: 67° 19′ — 15° 52′ — 293 — — ÷ 0·5°; 1 spec.
South of Jan Mayen: - 116: 70° 05′ — 8° 26′ — 371 — — ÷ 0·4°; 10 —
East of Iceland: St. 59: 65° 00′ N. L., 11° 16′ W. L., 310 fm., temp. ÷ 0·1°; 1 spec.
North-West of the Færoes: St. 138: 63° 26′ N. L., 7° 56′ W. L., 471 fm., temp. ÷ 0·6°; 1 spec.
— - — - 1: 62° 30′ — 8° 21′ — 132 — — 7·2°; 4 —

In Malac. Groenl. I have given a large number of localities for this species, the most northerly at 81° 44′ N. L. in Grinnell Land (Miers), also along Greenland itself from ca. 78 1/3 N. L. to 60° 43′ N. L.; it was taken in 2—3 fm., often in 10 to 20 fm., common in 40 to 100 fm., and was several times found in 118 to 260 fm. Later discoveries in these regions have not appreciably extended our knowledge; it is said by Ohlin and Ortmann that the species is common between 76° and 79° N. L. in 5 to 40 fm. Ohlin gives it also from the west side of Baffin Bay and Pfeffer had his *H. amazo* from the west side of the Davis Straits. — At East Greenland the species is common at Tasiusak, ca. 65° 37′ N. L. (Kruuse, Ryder Exp. and Amdrup Exp.); on the tract from ca. 69 1/2 N. L. to 74 1/2° N. L. it has been taken half a score of times (by the 2nd Amdrup Exp.), in 3—0 fm., 10 fm., 20 fm., 50 fm., 94 fm., 110 fm. and 120 fm.; in Hekla Harbour at 70° 27′ N. L., 26° 12′ W. L. it was taken in 1 to 11 fm. (Ryder); and it is noted by Ohlin and Buchholz from numerous localities between 71° 35′ N. L. and 74° 52′ N. L., in depths from 2 fm. and down to 186 fm.; lastly it has been taken even a little further north at Shannon Isl.

[1] In the list of synonyms to this species I have not included *S. incerta* Buchholz which was founded on a single specimen from East Greenland (Zweite Deutsche Nordpolarfahrt, B. II, p. 272). The reason is that though I consider it to have been founded on a specimen of *S. polaris* (Buchholz states however that an epipodite only occurs on the first and second pars of thoracic legs), I am not certain of my interpretation and as I did not wish to omit mentioning a species noted from East Greenland I have preferred to mention it here in a footnote.

(Buchholz). At Jan Mayen it has been taken in 16—122 fm. (Koelbel). — At Iceland it has been found in the fjords of the west coast (Ønundar Fjord), north coast (Øfjord) and east coast (Faskrud Fjord) in 4 to 10 fm.; off the coast it has been taken by the "Thor" at the following places:

East of North Iceland: 66° 02′ N. L., 11° 05′ W. L., 478—553 fm.

South of Iceland: 63° 15′ N. L., 22° 23′ W. L., 115—173 fm.

At the Færoes it is not common; I have only seen a few specimens from respectively Thorshavn and Sandvaag on Vaag Island.

Distribution. This species has been taken at the Shetlands and Hebrides (Norman). It also occurs at Bohuslän (Goës), in the Skager Rak (Intern. Explor.), on the south, west and north coasts of Norway (M. Sars, Appellöf), along the whole coast of the Murman Sea and in the White Sea (Birula), at Franz Joseph Land (Heller and Scott), in the Barents Sea, in depths from 37 to 192 fm. (Hoek); it is common round about Spitzbergen (G. O. Sars, Doflein) aud it has been taken west of this in 459 fm. (G. O. Sars). It is also common in the Kara Sea, 46—91 fm. (Hansen), but is unknown further to the east along the north coast of Asia. On the east coast of North America it goes as far south as 41° 34½′ N. L.; from there and to Halifax in Nova Scotia it has been taken a number of times in 10—15 fm. and down to 306 fm. (Smith); it is also known from the St. Lawrence estuary (Whiteaves) and at Labrador (Smith). Lastly, it is noted from the waters north of Bering Straits (Stimpson), also in the Bering Sea, Sea of Ochotsk and at the Aleutians "eastward to Kadiak, to a depth of 283 fathoms" (Mary Rathbun). — *H. polaris* is thus an arctic species, which extends deeply into the boreal region and is found both in positive and negative bottom-temperatures. It is taken at all depths from 3—0 fm. and down to 478—553 fm. ("Thor").

Remarks. The species attains a larger size in depths of ca. 50 fm. and more than in shallower water; as was to be expected the shallow-water specimens which live at East Greenland are on the whole larger than those at West Greenland. Amongst the specimens from the "Ingolf" St. 116 are some which are very large; one ♀ is 81·5 mm., a male 73·5 mm. long; the largest specimen I have seen, a ♀ 84 mm. long, was taken at 69° 40′ N. L., 23½ W. L., 120 fm., but Vanhöffen states that he has had a specimen of 88 mm. in length from Karajok Fjord (ca. 70° 20′ N. L.); Ohlin states that he has seen a specimen 89 mm. long from East Greenland. In 1895 I wrote that some females with eggs were taken by the Ryder Expedition to East Greenland on the following dates: August 1891, 13th Dec. 1891, 10th Jan. 1892, 8th Febr. and 27th April 1892; from these we may conclude that the species at least at this very cold locality (Hekla Harbour) has no definite spawning period, but seems to be able to spawn throughout the whole or almost the whole year.

58. Spirontocaris groenlandica J. C. Fabr.

1775. Astacus Groenlandicus J. C. Fabricius, Syst. Entom. p. 416.

1780. Cancer aculeatus O. Fabricius, Fauna groenl. n. 217, p. 239.

! 1842. Hippolyte aculeata Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 334, Tab. IV, Fig. 83—98 og Tab. V, Fig. 99—104.

Occurrence. This species was only found once by the "Ingolf".

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; many spec.

In Malac. Groenl. I have mentioned a large number of localities from 76° 8′ N. L. to 60° 8′ N. L. along the west coast of Greenland, and it has been taken at Grinnell Land at 82½° N. L.; concerning the depth I wrote that the species "is found very frequently in shallow water from about 5—10 fm., is common in 30—50 fm. and is noted several times from deep water, thus twice even from 200 fm." Later discoveries in these regions have not appreciably extended our knowledge; it is stated by Ohlin and Ortmann that the species is common between 76° and 79° N. L. in 5 to 40 fm. At East Greenland the species is common at Tasiusak, 65° 37′ N. L. (Kruuse, 1st Amdrup Exp.); it was taken by the 2nd Amdrup Exp. at 69° 44′ N. L., 23½° W. L. in the eel-seine, 3—0 fm., many specimens; at 74° 18′ N. L., 19° 50′ W. L., 10 fm., 1 specimen and at 74½° N. L., 18° 45′ W. L., anchorage, several specimens; it has been taken many times on the tract 72⅔° N. L. to at least 75° N. L. according to Ohlin and Buchholz. — It has never been found at Jan Mayen, Iceland or the Færoes.

Distribution. G. O. Sars writes that the Christiania Museum contains two specimens which 'from the label attached" were taken by Prof. Rasch at Christianssund. I have considerable doubts as to whether the two specimens really came from Christianssund, as this large and easily recognised species has not been taken in Europe either before or since. On the east coast of America it goes southward to ca. 41⅓° N. L.; from here and as far as Halifax in Nova Scotia it has been taken repeatedly in 1—72 fm. (Smith, M. Rathbun); it has also been taken in the St. Lawrence estuary, at Labrador (Smith), and in Cumberland Sound on the west side of Davis Straits (Pfeffer). It has also been found in the waters north of the Bering Straits and in the Bering Sea (Owen, Stimpson); along the west coast of America at Queen Charlotte Islands (Smith) and in Puget Sound, ca. 47° N. L. (Calman); lastly at Kamtschatka and the Kurile Islands (Brandt).

After giving a correct account of the distribution of this species Doflein writes: "Die Art ist somit cirkumpolar". Excluding Christianssund which lies far south of the Polar Circle (and which as mentioned must be regarded as doubtful), the species is still unknown from Jan Mayen and along the north coasts of Europe and Asia to the Bering Sea, thus, over almost 200 of the 360 degrees of longitude! We cannot deny, that Dr. Doflein does not ask much of the distribution of a species whose circumpolarity he considers as proved.

Remarks. The largest specimen I have seen is 119 mm. long from the tip of the rostrum; it was taken at Akugdlek, 68° 40′ N. L., on the west coast of Greenland.

59. Spirontocaris microceros Kr.

1841. Hippolyte microceros Krøyer, Nat. Tidsskr., 3. B., p. 579.

! 1842. — — Krøyer, Kgl. D. Vid. Selsk. math.-naturv. Afh., Niende Del, p. 341, Tab. V, Fig. 105—109.

Occurrence. The "Ingolf" has not taken this species.

In Malac. Groenl. I have given the following localities: Prøven (ca. 72° 23′ N. L.), Umanak, Ivigtut and Nanortalik (ca. 60° 8′ N. L.); the Copenhagen Museum also possesses some other West Greenland specimens, without special locality. The species has not been found at West Greenland

during the last twenty years or more; at East Greenland, Iceland and the Færoes it has never been found.

Distribution. This so easily recognised species has up to the present never been found elsewhere except at the West Greenland coast.

Remarks. One of the largest specimen, a female, is 54 mm. long.

Dr. Doflein writes: "Krøyer scheint nach meiner Ansicht diese Art auf ein etwas abweichendes (verletztes und geheiltes?) Exemplar von *H. aculeata* begründet zu haben". The learned author's boldness is displayed on so many different questions that it is quite remarkable. It gives him no trouble to express an opinion in this way on *H. microceros,* founded by so excellent an observer as Krøyer, though he himself has never seen a specimen of the species, in which the abdomen lacks the very obvious spinous equipment which characterises *H. aculeata* from all other Greenland species, whilst according to Krøyer *H. aculeata* lacks but *H. microceros* has epipodites on the third pair of thoracic legs. Lastly, Dr. Doflein opines that Krøyer has founded *H. microceros* "auf ein... Exemplar", whereas Krøyer "has found some few specimens", and indeed in the Latin diagnosis speaks of "Antennæ...marium" in contrast to the antennæ "in feminis", and must therefore have seen more than one specimen. From this and several cases mentioned previously it appears, that the learned carcinologist Dr. Doflein requires even less for his reading of an author he quotes or whose judgment he controverts than he does for a species, e. g. *S. groenlandica,* to make it "somit cirkumpolar".

60. Bythocaris leucopis G. O. Sars.

1879. Bythocaris leucopis G. O. Sars, Arch. f. Math. og Naturv., B. IV, p. 427.

! 1885. — — G. O. Sars, Den Norske Nordhavs-Exped., Crust. I, p. 27, Pl. III, Fig. 1—26.

Occurrence. The "Ingolf" has taken this species at 14 stations. These all lie in the Northern Ocean, within an area which is bounded to the east by a line from Jan Mayen to the Færoes and extends also so far to the west that it passes north round the north-eastern end of Iceland and from there southward round East Iceland to the Færoes. The stations are as follows:

St. 113: 69° 31′ N. L., 7° 06′ W. L., 1309 fm., temp. ÷ 1·0°; 1 small spec.
- 117: 69° 13′ — 8° 23′ — 1003 — — ÷ 1·0°; 9 spec.
- 118: 68° 27′ — 8° 20′ — 1060 — — ÷ 1·0°; 3 —
- 125: 68° 08′ — 16° 02′ — 729 — — ÷ 0·8°; 4 —
- 112: 67° 57′ — 6° 44′ — 1267 — — ÷ 1·1°; 2 —
- 119: 67° 53′ — 10° 19′ — 1010 — — ÷ 1·0°; 11 —
- 124: 67° 40′ — 15° 40′ — 495 — — ÷ 0·6°; 7 —
- 120: 67° 29′ — 11° 32′ — 885 — — ÷ 1·0°; 4 —
- 111: 67° 14′ — 8° 48′ — 860 — — ÷ 0·9°; 3 —
- 102: 66° 23′ — 10° 26′ — 750 — — ÷ 0·9°; 2 —
- 103: 66° 23′ — 8° 52′ — 579 — — ÷ 0·6°; 1 —
- 104: 66° 23′ — 7° 25′ — 957 — — ÷ 1·1°; 36 —
- 105: 65° 34′ — 7° 31′ — 762 — — ÷ 0·8°; 18 —
- 140: 63° 29′ — 6° 57′ — 780 — — ÷ 0·9°; 2 —

Further, two specimens were taken by the "Michael Sars" at 63° 3′ N. L., 6° 32′ W. L., 975 fm., temp. ÷ 0·51°.

Distribution. The species was founded on specimens from a station between Jan Mayen and Finmark, 1110 fm., temp. ÷ 1·3°; it was also taken in the stomach of *Rhodichthys regina* in the same waters in 1280 fm. (G. O. Sars). Ohlin gives it from three localities, one being between Greenland and Jan Mayen, depth 1064 fm., the second near the west coast of Spitzbergen: 76° 36′ N. L., 12° 10′ E. L., 930 fm., temp. ÷ 1·3°, the third almost midway between Spitzbergen and East Greenland: 77° 52′ N. L., 3° 5′ W. L., 1462 fm., temp. ÷ 1·4°. Birula mentions a single specimen from 79° 41′ N. L., 4° 58′ E. L., 1560 fm., temp. ÷ 1·1°. The species has thus been taken at depths from 495 fm. to about 1560 fm. with bottom-temperatures between ÷ 0·6° and ÷ 1·4° in the waters between the Færoes, Iceland, Norway, Spitzbergen and East Greenland with negative bottom-temperature at considerable depths.

Remarks. The largest specimens I have are females with eggs from St. 104, 117 and 118, and they measure 87—87·5 mm. From St. 119 there is a female with eggs 81 mm. long, from St. 105 a similar female 73·5 mm., from St. 125 and 140 two females with eggs 75 mm. long and from the last station a female with eggs only 69 mm. long. Sars gives the length "up to 95 mm."; I must suppose that he has measured from the tip of the rostrum (not, as suggested by Ohlin, from the end of the antennal scale) to the end of the telson. — The antennal scale varies a little in form with the size of the animal: its terminal margin is less oblique and scarcely so curved in the large specimens as in the small, and distally it is a trifle broader in the large than in the small specimens.

61. **Bythocaris Payeri** Hell.

1875. Hippolyte Payeri Heller[1], Denksch. d. K Akad. d. Wiss., Math.-naturv. Classe, B. 35, p. 26, Taf. I, Fig. 1—4.

1882. Bythocaris payeri Hoek, Nied. Arch. f. Zool., Supplb. I, Crust. p. 19, Fig. 8—9.

! 1885. — Payeri G. O. Sars, Den norske Nordhavs-Exp., Crust. I, p. 33, Pl. III, Fig. 27.

Occurrence. The "Ingolf" has taken this species at 8 stations. Just as for the previous species, the stations lie in the Northern Ocean, within an area which to the east is bounded by a line from Jan Mayen to the Færoes and also extends so far to the west as to pass to the north round the north-eastern end of Iceland and southward round East Iceland down to the Færoes. The stations are as follows:

St. 116: 70° 05′ N. L., 8° 26′ W. L., 371 fm., temp. ÷ 0·4°; great quantity of spec.
- 124: 67° 40′ — 15° 40′ — 495 — — ÷ 0·6°; 13 spec.
- 126: 67° 19′ — 15° 52′ — 293 — — ÷ 0·5°; 1 —
- 101: 66° 23′ — 12° 05′ — 537 — — ÷ 0·7°; 3 —
- 103: 66° 23′ — 8° 52′ — 579 — — ÷ 0·6°; 4 —
- 59: 65° 00′ — 11° 16′ — 310 — — ÷ 0·1°; 1 —
- 139: 63° 36′ — 7° 30′ — 702 — — ÷ 0·6°; 2 —
- 138: 63° 26′ — 7° 56′ — 471 — — ÷ 0·6°; 13 —

[1] The same year the author had published a brief preliminary description without figures in Sitzb. K. Akad. Wissensch. 1. Abth., April-Heft, Jahrg. 1875.

Further, the species has been taken at 66° 2′ N. L., 11° 5′ W. L., 552—478 fm. ("Thor" 1903). It has never been found at West Greenland; at East Greenland the species has been taken five times between 74° 52′ N. L. and 72° 28′ N. L., depths from 95 to 185 fm. (Ohlin). At Jan Mayen it has been taken in 678 fm. (Ohlin). South of the Færoes it has been found at 61° 23′ N. L., 4° 21′ W. L., 505 fm., temp. ÷ 0·4°, 5 specimens (Wandel), and it is given from 60° 3′ N. L., 5° 51′ W. L., 540 fm. (Norman).

Distribution. The species was first taken at Franz Joseph Land, 97 fm. (Heller). It was taken by the Norwegian North-Atlantic Expedition at 9 stations with negative bottom-temperatures and all lying in the waters west of Norway and from there up to the west of Spitzbergen from 63° 17′ N. L. to 79° 59′ N. L. (G. O. Sars). The depths varied between 350 fm. and 1081 fm. It is also given from 78° 2′ N. L., 9° 25′ E. L., 416 fm., with a bottom-temperature of 0·8° (G. O. Sars), likewise from 79° 58′ N. B., 9° 30′ E. L., 224 fm. with a bottom-temperature of 1·5° (Ohlin), but both stations lie on the border of the cold area. Lastly, the species has been taken in the eastern part of Barents Sea: 75° 16′ N. L., 45° 19′ E. L., 160 fm. (Hoek).

It appears from the above that the species is found only at depths from ca. 100 fm. to 1080 fm. in the cold area from the Færoe Channel northwards to the northern part of East Greenland, Spitzbergen, Franz Joseph's Land and the Barents Sea; it has twice been taken in the neighbourhood of Spitzbergen near the boundary to the area mentioned, in temperatures a little above 0°.

Remarks. The species stands extremely near to *B. gracilis* Smith, as is mentioned below, where the differences between the two forms are also dealt with.

62. **Bythocaris gracilis** S. I Smith.

1885. Bythocaris gracilis S. I. Smith, Proc. U. S. Nat. Mus., Vol. VII, p. 497.

1886. — — S. I. Smith, Rep. Comm. Fish and Fisheries for 1885, p. 658, Pl. XII, figs. 3, 4.

Occurrence. This species was taken by the "Ingolf" at three stations:

Davis Straits: St. 28: 65° 14′ N. L., 55° 42′ W. L., 420 fm., temp. 3·5°; 3 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 2 —

South of West Iceland: St. 67: 61° 30′ N. L., 22° 30′ W. L., 975 fm., temp. 3°; 1 spec.

Distribution. Previously, only two specimens in all were known from two localities east of North America, namely, about 39½° N. L. and 35¾° N. L. in 1043 fm. and 888 fm., temp. 38° and 39° Fahr.

Remarks. My specimens must be referred to *B. gracilis* Smith; but the following remarks have to be made. The median dorsal spine on the gastric region occurs in all specimens; in one of them it is certainly very small and it occurs in some specimens of *B. Payeri* from St. 116, so that its presence in *B. gracilis* is not a valuable character. The eyes in *B. gracilis* are but little larger than in *B. Payeri;* it is necessary however to carefully choose equally large specimens of both species for comparison. The best character between the two seems to be, that the antennal scale is somewhat narrower and a little longer in *B. gracilis,* but the difference is much smaller than is given in Smith's description, and in *B. Payeri* the scale becomes relatively a little broader with age. Smith's figure of *B. Payeri* was drawn from a specimen larger than the one which formed the subject for his figure

of *B. gracilis,* and it is therefore to a certain extent misleading. Further, there is also some difference in the form of the scale in my specimens of *B. gracilis:* in the specimen from St. 67 the part beyond the spine on the outer margin is more prolonged, the scale itself relatively longer and with almost parallel margins; the specimen thus differs in the form of the scale more from *B. Payeri* than is the case with the specimens from the Davis Straits, in which the margins of the scale diverge forwards. — The differences between *B. Payeri* and *B. gracilis* are thus very small, but as the differences exist the species should be maintained, at any rate until further knowledge of the variation and geographical distribution has been obtained.

63. Bythocaris simplicirostris G. O. Sars.

1870. Bythocaris simplicirostris G. O. Sars, Vid. Selsk. Forh. Christiania, f. 1869, p. 149.
! 1874. Hippolyte Panschii Buchholz, Zweite Deutsche Nordpolarfahrt, B. II, p. 277, Taf. I, Fig. 1.
1894. Bythocaris simplicirostris Norman, Ann. Mag. Nat. Hist., Ser. 6, Vol. XIII, p. 270, Pl. XII, fig. 1.
1897. — — Birula, L'Annuaire du Mus. Zool. de l'Acad. Imp. de St.-Pétersbourg, 1897, p. 427, Tab. XX, Fig. 3.
1901. — — Ohlin, Bih. till K. Svenska Vet.-Akad. Handl., B. 27, Afd. IX, no. 8, p. 39, Fig. 1.

Occurrence. The "Ingolf" has only taken this species at one station.

South-East of Iceland: St. 4: 64° 7′ N. L., 11° 12′ W. L., 237 fm., temp. 2·5°; 1 spec.

The species is described under the name *Hippolyte Panschii* by Buchholz from a specimen taken in 30 fm. at Nordshannon, which lies in ca. 75° N. L. on East Greenland; I have seen an East Greenland specimen from ca. 74$^1/_3$° N. L., near Pendulum Islands, 110 fm. (2nd Amdrup Exped.), and a specimen was taken in 133 fm. a little more to the south, namely, off Kaiser Franz Joseph Fjord (Ohlin). Lastly, I have seen a specimen taken a little east of the south end of the Færoes: 61° 23′ N. L., 5° 04′ W. L., 255 fm., temp. 0° (Wandel).

Distribution. Sars founded *B. simplicirostris* (see Remarks) on a specimen taken at Skraaven (Lofoten) in 250 fm.; later, it was taken by the same author at 72° 27′ N. L., 20° 51′ E. L., 191 fm., temp. 3·5° and at 78° 2′ N. L., 9° 25′ E. L., 416 fm., temp. 0·8°; Metzger notes it from Mandal, 60 fm., Norman from Trondhjem Fjord, 250—300 fm., Nordgaard from Tranø Deep, 322—340 fm., and from Malangen (ca. 69$^1/_2$° N. L.), ca. 50—100 fm. Lastly, it is given from the western part of the Murman Sea (Birula).

Remarks. I have referred my specimens to *B. simplicirostris* and included *B. Panschii* as a synonym. If the former is incorrect, I venture to think with a considerable degree of certainty, that Ohlin's specimen from East Greenland and G. O. Sars' specimens from ca. 72$^1/_2$° and 78° N. L. have also been incorrectly determined, as all these have undoubtedly belonged to *B. Panschii.* The question is therefore, whether this species is identical with *B. simplicirostris* or not. It cannot be settled with certainty from the available descriptions, but both the distribution and Sars' own reference of his specimens from the Norwegian North-Atlantic Expedition to the species from Lofoten speak strongly in favour of it. Sars certainly writes: "Oculi minimi subcylindrici, pigmento pallide fulvescente", and this seems to tell strongly against my determination (unfortunately, neither Sars nor Ohlin refer later

to the point), but Norman — who captured two specimens in the Trondhjem Fjord, says: "Eyes well developed, on long peduncles, when laterally projected extending beyond the sides of the carapace", and my three specimens show extremely peculiar differences with regard to the eyes. In the "Ingolf" specimen the one eye preserved is grey-brown, but it is black in the two other specimens; the specimen from East Greenland is a female with eggs, the eye-stalks are cylindrical in almost their whole length and scarcely thinner than the diameter of the eye; the latter in this specimen is not only relatively considerably smaller but almost absolutely smaller than in the two other considerably smaller specimens, but in both of these the eye itself is obviously broader than the stalk and the latter is strongly conical in the specimen from the Færoes. Whether all this variation indicates anything or not, in other words, whether there should be two (or three) species extremely closely related or only a single species, variable with respect to the eyes, neither my small and far from perfect material nor the literature can give any final decision. But I am greatly inclined to consider, that not only my own specimens but also those mentioned by earlier authors of *B. simplicirostris* and *B. Panschii* belong to the same species.

64. Caridion Gordoni Bate.

? Hippolyte Gordoni Bate, Nat.-Hist. Review, V, p. 51 [test. Norman].
1861. Doryphorus — Norman, Ann. & Mag. Nat. Hist., Ser. 3, Vol. VIII, p. 277, Pl. XIII, figs. 6 & 7.
1863. Caridion — Goës, Öfv. K. Svenska Vet.-Akad. Förhandl., 20 Årg., p. 170.

Occurrence. This species has not been taken by the "Ingolf". It has only been found twice by the "Thor" within the area dealt with in this work.

South-West of Iceland: West of Geirfugleskær, many small spec. and larvæ.

South of West Iceland: 63° 15′ N. L., 22° 23′ W. L., 114—173 fm.; many spec.

Distribution. The species is known from the Shetlands and the Hebrides (Norman), Scotland (Norman), the Irish Sea (Walker), North Sea: 48 miles W. of Blaavandshuk, 22 fm. (Metzger); also from Bohuslän on the west coast of Sweden, 10—15 fm. (Goës); lastly, from several places on the south and west coast of Norway, especially in the region of the deep-sea corals, and Varanger Fjord on the east coast of Finmark (G. O. Sars). When Sars writes on the basis of the last find: "it seems from this that the present form must be regarded as a northerly, perhaps even an arctic form", it must be said that its distribution shows that it is certainly not arctic. Further, it has also been taken at a number of places on the east coast of the United States from Fundy Bay to Cape Cod, in depths between 27 and 110 fm., but not in the Gulf of St. Lawrence (S. I. Smith).

65. Pandalus borealis Kr.

1838. Pandalus borealis Krøyer, Naturh. Tidsskr. 2. B., p. 254.
1845. — — — Naturh. Tidsskr., Ny R., 1. B., p. 461.
1846. — — — Voy. en Scand., Crust. Pl. 6, figs. 2, a—o.

Occurrence. The "Ingolf" has taken this species at 10 localities.

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 5 spec.
— — » 29: 65° 34′ — 54° 31′ — 68 — — 0·2°; 8 —

Davis Straits: Ameragdla, head of Ameralik Fjord at Godthaab; 1 spec.
East of South Greenland: St. 94: 64° 56′ N. L., 36° 19′ W. L., 204 fm., temp. 4·1°; 1 spec.
North-West of Iceland: St. 129: 66° 35′ — 23° 47′ — 117 — — 6,5°; 12 —
North of Iceland: St. 128: 66° 50′ N. L., 20° 02′ W. L., 194 fm., temp. 0·6°; 12 spec.
— - — - 126: 67° 19′ — 15° 52′ — 293 — — ÷ 0·5°; 14 spec.
— - — - 124: 67° 40′ — 15° 40′ — 495 — — ÷ 0·6°; 1 —
East of Iceland: St. 59: 65° 00′ N. L., 11° 16′ W. L., 310 fm., temp. ÷ 0·1°; 2 spec.
North-West of the Færoes: St. 2: 63° 04′ N. L., 9° 22′ W. L., 262 fm., temp. 5·3°; 1 spec.

According to the Malac. Groenl. the species is very abundant from Umanak, ca. 70° 42′ N. L., southwards along the west coast of Greenland, in depths from 75 to 265 fm.; two of a number of later finds in the same waters were in shallower water, but it has also twice been taken near 65½ N. L. in depths such as 289 fm. and 349 fm., temp. 4·5° and 3·2° respectively. It has been taken further in the fjords along the north-west, north and east coasts of Iceland (Dyre Fjord, Patrik Fjord, Arnar Fjord, Skagestrand Bay, Skálfandi, Mid Fjord, Seydis Fjord, Røde Fjord, Faskrud Fjord) and is common more or less to sea off the same coastal regions in depths from 18—19 fm. to 287 fm.; on the other hand I know it from only two localities off the west or south coast of Iceland, namely, 63° 46′ N. L., 22° 56′ W. L., 79 fm. ("Thor" 1903) and 63½ N. L., 17° 31′ W. L., 92 fm., temp. 7° (Wandel); it has not been taken at the Færoes. At East Greenland it has only been taken off Angmagsalik (65° 37′ N. L.), 140 fm. (2nd Amdrup Exped.), thus far to the south-west of the ridge across the Denmark Straits.

Distribution. The species occurs in the Skager Rak (Joh. Petersen), at Bohuslän (Goës) and up in the Christiania Fjord, sometimes in great depths on the west and south coasts of Norway (G. O. Sars), in the fjords of Finmark (G. O. Sars), from there to Bear Island and Spitzbergen, where it occurs nearly everywhere with exception of north and east of the most northern island, and goes northward to 81° 14′ N. L. in depths from ca. 50 to 260 fm. and in temperatures most frequently above 0° (G. O. Sars, Ohlin, Doflein, Birula); lastly, a little south of Franz Joseph Land, 140 fm. (Heller). It is also found in the western and northern parts of the Murman Sea (Birula) and in the Barents Sea (Hoek); two specimens brought home by the "Dijmphna" were taken in the Kara Sea in 49 and 100 fm. (Hansen). — On the east coast of America it has been taken from Massachusetts Bay to Nova Scotia, 40 to 160 fm. (S. I. Smith, M. Rathbun). It is noted from the Sea of Ochotsk and Unaljaschka (Wosnesenski); and on the west coast of North America it is found in the Bering Sea and in the Pacific southward to 46° N. L., 29½—350 fm. (Mary Rathbun).

The species is never littoral, it is met with in fjords in depths from scarcely 20 to 60 fm., but outside these usually in 80 to 300 fm.; it has been taken a single time in 495 fm. It is usually found in positive bottom-temperatures, but it appears especially from the "Ingolf's" results and Birula's statements (1907) that it can also occur in cold water, down to ÷ 1·8°. It is obviously rare in the Kara Sea, though I believe that the two localities from this sea are correctly given by me (they occurred thus in the collection); that it has not been taken at northern East Greenland shows however, that it is scarcely so marked an arctic form as various other decapods (Ohlin expresses the opinion that it probably "ought not to be regarded as a true Arctic form, but rather as a North Atlantic (and North Pacific) species", but this view is somewhat exaggerated).

66. **Pandalus Montagui** Leach.

1814. Pandalus Montagui Leach, Edinburgh Encyclopædia, VII, p. 432 [teste Calman].
1845. — annulicornis Krøyer, Naturh. Tidsskr., Ny R., 1. B., p. 469.
1846. — — Krøyer, Voy. en Scand., Crust., Pl. 6, figs. 3 a—e.
! 1899. — Montagui Calman, Ann. & Mag. Nat. Hist., Ser. 7, Vol. III, p. 30, Pls. I—IV, fig. 1.

Occurrence. The "Ingolf" has taken this species at four stations.

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 19 spec.

North-West of Iceland: St. 129: 66° 35′ N. L., 23° 47′ W. L., 117 fm., temp. 6·5°; 1 spec.

North of Iceland: St. 127: 66° 33′ N. L., 20° 05′ W. L., 44 fm., temp. 5·6°; 13 spec.

South of East Iceland: St. 51: 64° 15′ N. L., 14° 22′ W. L., 68 fm., temp. 7·3°; 1 spec.

According to the data in Malac. Groenl., later finds and a statement by Ohlin, the species is not rare along the west coast of Greenland in the region from Godhavn at 69° 14′ N. L. to Godthaab, 64° 11′ N. L., in depths from 4 to 40 fm.; it has never been found on the east coast of Greenland nor at Jan Mayen. The species is common all round the coasts of Iceland (for example, it has been taken at Skagi, Stykkisholm, in Patrik Fjord, Dyre Fjord, Ønundar Fjord, Øfjord, Seydis Fjord, Faskrud Fjord etc.) in depths from 3—4 fm. to 80 fm.; it is likewise very common at the Færoes from 1—3 fm. to 60 fm.

Distribution. The species is common along the whole coast of Great Britain (Calman), and has been taken at the Channel Islands (Norman), in Holland (Hoek), on the eastern side of the North Sea, in the Skager Rak and Kattegat, from there some distance into the Sound, within the Belts (Meinert) and in the most western part of the Baltic, in Kiel Bay and Eckernförde Bay (Möbius); also, along the whole coast of Norway (M. Sars); (Nordgaard notes it from a number of Norwegian fjords and from depths of ca. 10 to 160 fm.), on the coast of the western part of the Murman Sea and in the White Sea (Birula). On the east coast of America the species is found at Labrador, in the St. Lawrence, at Nova Scotia and goes further south past Cape Cod to 41° 25′ N. L., usually in depths between 10 and 70 fm. (S. I. Smith). A form or variety, *P. Montagui tridens* M. Rathbun, is common along the west side of North America from the Bering Sea to 39° N. L., 3—351 fm. (Mary Rathbun).

This species is common in England in "tide-pools" and the greatest certain depths for it are 116 fm. ("Ingolf" St. 129) and 121 fm. (Rathbun), Smith's statement (Trans. Conn. Acad. Vol. V) of a single occurrence in 430 fm. having to be regarded with some doubt until a trustworthy, new, similar observation has been made in the Atlantic.

Remarks. The largest specimen I have seen measures 105 mm. from the tip of the rostrum to the end of the telson; it was taken at 65° 18′ N. L., 53° 21′ W. L., 65 fm., temp. 1° (Wandel).

67. **Pandalus propinquus** G. O. Sars.

1870. Pandalus propinquus G. O. Sars, Forh. Vid. Selsk. Christiania f. 1869, p. 148.
1886. — — S. I. Smith, Rep. U. S. Comm. Fish and Fisheries for 1885, Pl. XIII, fig. 1.
! 1899. — — Calman, Ann. & Mag. Nat. Hist., Ser. 7, Vol. III, p. 32, Pls. I—IV, fig. 2.

Occurrence. The "Ingolf" has taken this species at 18 stations.

Davis Straits: St. 32: 66° 35′ N. L., 56° 38′ W. L., 318 fm., temp. 3·9°; 1 spec.
— — - 35: 65° 16′ — 55° 05′ — 362 — — 3·6°; 1 —
— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 1 —
— — - 25: 63° 30′ — 54° 25′ — 582 — — 3·3°; 2 —
West of Iceland: St. 90: 64° 45′ N. L., 29° 06′ W. L., 568 fm., temp. 4·4°; 2 spec.
— - — - 89: 64° 45′ — 27° 20′ — 310 — — 8·4°; 2 —
— - — - 9: 64° 18′ — 27° 00′ — 295 — — 5·8°; 3 —
South-West of Iceland: St. 85: 63° 21′ N. L., 25° 21′ W. L., 170 fm., temp. ? ; 1 spec.
— - — - 83: 62° 25′ — 28° 30′ — 912 — — 3·5°; 1 —
— - — - 81: 61° 44′ — 27° 00′ — 485 — — 6·1°; 1 —
— - — - 78: 60° 37′ — 27° 52′ — 799 — — 4·5°; numerous spec.
South of Iceland: St. 64: 62° 06′ N. L., 19° 00′ W. L., 1041 fm., temp. 3·1°; 3 spec.
— - — - 65: 61° 33′ — 19° 00′ — 1089 — — 3·0°; 1 —
— - — - 54: 63° 08′ — 15° 40′ — 691 — — 3·9°; 1 —
— - — - 53: 63° 15′ — 15° 07′ — 795 — — 3·8°; 1 —
— - — - 57: 63° 37′ — 13° 02′ — 390 — — 3·4°; 3 —
West of the Færoes: St. 47: 61° 32′ N. L., 13° 40′ W. L., 950 fm., temp. 3·2°; 1 spec.
— - — - 46: 61° 32′ — 11° 36′ — 720 — — 2·4°; 2 —

Within the region where it was taken by the "Ingolf" it has also been found several times by Wandel and the "Thor".

Distribution. It has been taken twice in the lochs on the west coast of Scotland, at one of these places in 40 fm. (Calman), at several places on the west coast of Norway in 80 to 300 fm. (G. O. Sars), and it goes up to Malangen, ca. 69½ N. L. (Nordgaard); lastly, it has been taken a number of times on the east coast of New England, as far south as 39⅕ N. L., in 116 to 640 fm. (Smith, M. Rathbun). According to the data above it goes with the warm Atlantic water up into Davis Straits at least to 66° 35′ N. L., and is common in the deep water down to 1089 fm. in the waters west and south of Iceland. The bottom-temperature is usually over 3°, a single time 2·4°.

Remarks. For this as for the foregoing and the two following species reference may be made to Calman's careful descriptions. I shall only remark on a single point. Calman says that the carpus of the second right leg is divided by 4 articulations, that is, into 5 joints; Sars gives 6. Calman's number is by far the most common, but it may still be somewhat higher; on an extremely characteristic specimen from St. 54 I found 7 distinct articulations; the proximal joint further was divided into two weak articulations only seen in a certain light, so that the carpus in this case had really 10 joints. — None of my specimens attain the length given by Sars and Smith.

68. **Pandalus Bonnieri** Caull.

1882. Pandalus leptorhynchus G. O. Sars, Vid. Selsk. Forh. Christiania for 1882, No. 18, p. 47, Tab. I, Fig. 8—10.
1896. Dichelopandalus Bonnieri Caullery, Ann. l'Univ. Lyon, 1896, p. 379, Pl. XV, Fig. 7—15.
! 1899. Pandalus Bonnieri Calman, Ann. & Mag. Nat. Hist. Sec. 7, Vol. III, p. 34, Pls. I—IV, fig. 3.

Occurrence. The "Ingolf" has not found this species, but in 1903 it was twice taken by the "Thor" a little to the south of Iceland: namely: 63° 15′ N. L., 22° 23′ W. L., 114—173 fm. and 63° 16′ N. L., 19° 57′ W. L., 137—207 fm.

Distribution. Calman gives the species from two lochs on the west coast of Scotland, from Rockall and off the south-west coast of Ireland. The depths were from 40 to 214 fm. Caullery gives it from the Bay of Gascony in depths from 95 to 638 fm. Sars and Appellöf notes it from Drøbak in Christiania Fjord, from Bergen, Sogne Fjord and Aalesund, thus up to ca. 62½ N. L., depths 60—230 fm.; further, it is given from Salten Fjord ca. 67⅓ N. L., 170—200 fm. (Nordgaard); I have seen one specimen taken to the west of the most southern part of Norway: 58° 32′ N. L., 4° 18′ E. L., 149 fm. (Joh. Schmidt).

69. **Pandalina brevirostris** Rathke.

1843. Pandalus brevirostris Rathke, Nova Acta Ac. Cæs. Leop.-Car., Tab. XX, p. 17.
1863. — — Heller, Crust. südl. Eur., p. 247, Taf. VIII, Fig. 9.
1982. — — Hoek, Nied. Arch. für Zool., Supplb. I, Crust. p. 22, Taf. I, Fig. 10.
! 1899. Pandalina — Calman, Ann. & Mag. Nat. Hist., Sec. 7, Vol. III, p. 37, Pls. I—IV, fig. 4.

Occurrence. It has not been taken by the "Ingolf". I have only seen a single specimen, taken at Trangisvaag in the most southern part of the Færoes, 8—9½ fm. (Dr. F. Jørgensen).

Distribution. The species is common at Shetland (Norman), is met with all round the coasts of Great Britain (Calman), and is found on the northern and north-western coasts of France (Bonnier). It has several times been taken in the Mediterranean, thus at the Cyclades (Adensamer), in the Adriatic Sea at several places (Heller, Adensamer), on the east coast of Sardinia (Senna), the depth varying from 16 to 235 fm.; according to Senna the "Travailleur" has taken it (in the Mediterranean?) at 566 fm. In northern seas it has been taken at the coast of Holland, 10 fm. (Hoek), also in the Kattegat and in the northernmost part of the Sound in depths from 10½ to 26 fm. (Meinert), at Bohuslän (Goës), along the coast of Norway to Malangen, 69° 33′ N. L. (Nordgaard); it has not been mentioned from East Finmark by Norman nor by Birula from the Murman Sea. Nordgaard gives numerous localities on the west coast of Norway, but most of the depths are from 100 to 200 fm., in a single case even over 300 fm., which makes me think that the species has perhaps not come into the fishing apparatus at the very bottom. Hoek (l. c.) gives it from 74° 16′ N. L., 29° 47′ E. L., 192 fm.; this find is extremely interesting and may be considered correct, it seems to me, as the possibility of an error in determination appears excluded, and we can hardly have doubts as to the locality; according to the chart in the "Norwegian North-Atlantic Expedition" this locality lies within the area with bottom-temperatures over 0°.

70. **Nematocarcinus exilis** Bate.

1888. Stochasmus exilis Bate, Rep. Challenger Vol. XXIV, p. 823, Pl. CXXXII, fig. 14.
! 1896. Nematocarcinus exilis Calman, Trans. Roy. Irish Acad. Vol. XXXI, Part I, p. 6.

Occurrence. The "Ingolf" has taken this species at 7 stations.

South-West of Iceland: St. 74: 62° 17′ N. L., 24° 36′ W. L., 695 fm., temp. 4·2°; 1 spec.
South of Iceland: St. 68: 62° 06′ N. L., 22° 30′ W. L., 843 fm., temp. 3·4°; 2 spec.
— - — - 67: 61° 30′ — 22° 30′ — 975 — — 3·0°; fragments.
— - — - 40: 62° 00′ — 21° 36′ — 845 — — 3·3°; 10 spec.
— - — - 66: 61° 33′ — 20° 43′ — 1128 — — 3·3°; 1 —
— - — - 63: 62° 40′ — 19° 05′ — 800 — — 4·0°; 1 —
— - — - 47: 61° 32′ — 13° 40′ — 950 — — 3·2°; 1 —

Distribution. Sp. Bate's single specimen was taken in the neighbourhood of the Canary Isles. Many specimens were taken south-west of Ireland, 750 fm. (Calman). According to the above it is a purely deep-water form from the Atlantic; it has without doubt a much greater geographical distribution than as yet known.

Remarks. My specimens agree with Calman's remarks; further, before I read this author, I had considered them to belong to Bate's species. It differs from *N. ensiferus* Bate in the shorter rostrum, the length of which is between that in *N. ensiferus* and *N. cursor* A. M.-Edw.; it also differs from *N. ensiferus* in that the eyes seem a little larger; further, the posterior corner of the fifth abdominal segment is less drawn out though it ends in a very small or rudimentary spine; lastly, the third abdominal segment is less produced than in *N. ensiferus*.

71. **Acanthephyra purpurea** A. Milne-Edw.[1]

1881. Acanthephyra purpurea A. Milne-Edwards, Comp. Rend. Ac. Sc. Paris, T. XCIII, p. 933.
! 1882. Miersia Agassizii S. I. Smith, Bull. Mus. Comp. Zool. X, p. 67, Pl. XI, figs. 5—7, Pl. XII, figs. 1—4.
1884. Acanthephyra Agassizii S. I. Smith, Rep. U. S. Comm. Fish & Fishery for 1882, p. 372, Pl. VIII, fig. 1.
1886. — — S. I. Smith, Rep. U. S. Comm. Fish & Fishery for 1885, p. 667, Pl. XV, figs. 1, 6, 6 a. 7; Pl. XIV, fig. 2.
1888. — purpurea Sp. Bate, Rep. Challenger, Vol. XXIV, p. 733, Pl. CXXIV, fig. 3.

Occurrence. The species has been taken by the "Ingolf" at 6 stations.
Davis Straits: St. 25: 63° 30′ N. L., 54° 25′ W. L., 582 fm., temp. 3·3°; 1 spec.
West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm., temp. 0·3°; 1 spec.
— - — - 11: 64° 34′ — 31° 12′ — 1300 — — 1·6°; 1 —
— - — - 91: 64° 44′ — 31° 0′ — 1236 — — 3·1°; 1 —
South-West of Iceland: St. 17: 62° 49′ N. L., 26° 58′ W. L., 745 fm., temp. 3·4°; 1 spec.
South of Iceland: St. 69: 62° 40′ N. L., 22° 17′ W. L., 589 fm., temp. 3·9°; 1 spec.

Further, it has been taken at 62° 11′ N. L., 19° 36′ W. L., 1000—1100 fm. ("Thor") and south-west of the Færoes at 59° 28′ N. L., 8° 1′ W. L., 687 fm. (Bergen Museum). In 1904 it was taken by the "Thor" at the following places:

[1] After the text on this species was written I received Stanley W. Kemp's very elaborate study on *Acanthephyra* in "Fisheries, Ireland, Sci. Invest. 1905, I., [1906]". The author spends more than twelve pages on *A. purpurea*, giving the dreadful synonymy and numerous new details on its characters, variation, distribution, etc. Instead of adding to my own text, I have preferred to refer readers to Mr. Kemp's paper.

West of North Iceland: 65° 00′ N. L., 28° 10′ W. L., young-fish trawl, 1000 m. wire out, depth of the sea 1240 m.; 2 spec.

South of Iceland: 61° 34′ N. L., 19° 05′ W. L., young-fish trawl, 1800 m. wire out, depth of the sea 2160 m.; 4 spec.

South of Iceland: 61° 30′ N. L., 17° 08′ W. L., young-fish trawl, 1800 m. wire out, depth of the sea ? m.; 8 small spec.

South of Iceland: 62° 47′ N. L., 15° 03′ W. L., young-fish trawl, 1500 m. wire out, depth of the sea 1950 m.; 1 spec.

Distribution. On the European side of the Atlantic, this species has been taken in the Bay of Gascony, 425 fm. (Caullery), off Portugal, 1378 fm. (A. Milne-Edwards), south-west of the Azores, 1675 fm., and at the Canary Isles, 1675 fm. (Sp. Bate), also south of the Cape Verde Isles at 2128 fm. and in the vertical net from 0 to 213 fm. (Ortmann). In the Mediterranean it has been taken at Messina (Riggio) and near Monaco, at the last place in a large net sunk to a little over 1000 fm. (Lo Bianco). It has also been taken northwest of the Bermudas, 2675 fm. (Sp. Bate) and at a number of places off the east coast of America between 31° 41′ N. L. and 42° 2′ N. L., the depths varying from 105 to 2949 fm. (S. I. Smith). But Smith writes further (Rep. Comm. Fish... for 1885, p. 63), that a single specimen was taken "at the surface in a dip-net, and was kept alive for half an hour". This and another reason given induced Smith to write: "These facts lead me to suppose that this species is not a habitual inhabitant of the bottom at great depths, but more probably a truly free-swimming inhabitant of some part of the vast region intermediate between the surface and the bottom, such a one as might occasionally stray to the surface or to considerable depths". The observations mentioned by Ortmann and Lo Bianco of specimens taken in the vertical net agree with this. To judge from the structure of the animal and from the 4 catches made by the "Thor" in 1904, Smith's supposition seems quite justified.

Whether the specimens referred by Faxon (Mem. Mus. Comp. Zool. XVIII, p. 161) with a query to *A. Agassizii* really belong to this species, I am unable to determine; they came from the Pacific in the Gulf of Panama and somewhat further south.

Remarks. It is perhaps right to add that the specimens investigated by me certainly belong to the *A. Agassizii* so well described and figured by Smith; in referring it as synonym to *A. purpurea* I have only followed the authors. — At the time of capture of the specimens taken by the "Ingolf" at St. 11 and St. 12 it was noted: "animals clear, blood-red all over, eyes black".

72. **Acanthephyra gracilis** S. I. Smith.

! 1882. Miersia gracilis S. I. Smith, Bull. Mus. Comp. Zool. Vol. X, p. 70, Pl. XI, figs. 4—4d; Pl. XII, fig. 10.
1886. — — S. I. Smith, Rep. Comm. Fish and Fisher. for 1885, p. 672.

Occurrence. The "Ingolf" has not taken this species but it was brought home in 1904 by the "Thor" from the following locality.

South of Iceland: 62° 47′ N. L., 15° 03′ W. L., 1950 m., young-fish trawl, 1500 m. wire out; 1 spec.

Distribution. The species was founded on a specimen taken off the east coast of America

at 34° 28′ 25″ N. L., 75° 22′ 50″ W. L., 1632 fm.; later, a specimen was taken somewhat more to the north, namely, 36° 05·5′ N. L., of the same coast at 2512 fm. In 1905 a number of specimens were captured by the "Thor" in the young-fish trawl at two stations respectively west of the Channel and west of Brittany. The species is a bottom form certainly just as little as *A. purpurea*. The length of the wire out was in five catches respectively 1800, 900, 300, 300 and 200 m.; with 200 m. out only quite small specimens were taken, while the two largest specimens were taken with 1800 and 900 m., and with 900 m. both large and rather small specimens were taken.

Remarks. In his above mentioned paper Stanley Kemp refers *A. gracilis* Smith as a synonym to *A. debilis* A. M.-Edw. Not having seen the French author's figure I have no opinion on the question. My specimens agree well with the description and figure given by Smith, but not so well with Kemp's description and figures of *A. debilis*. The lateral plates of the fifth abdominal segment have their posterior margin less convex than in Kemp's fig. 4 and possess nearly always the marginal tooth pointed out by Smith. Further, the telson has several dorsal pairs of spines in front of the large pair, and the terminal part beyond the last pair of spines is considerably longer than shown by Kemp. Finally, I cannot see any vestige of the luminous organs described by Kemp. For these reasons I must leave the question of synonymy to future investigators.

73. **Acanthephyra Batei** Faxon.

Pl. IV, fig. 2 a (named *A. brevirostris*).

1888. Acanthephyra brevirostris Sp. Bate, Rep. Challenger, Vol. XXIV, p. 751, Pl. CXXVI, figs. 5—6.
1897. — batei, Faxon, Mem. Mus. Comp. Zool., Vol. XVIII, p. 167.

Occurrence. The "Ingolf" has not found this species but it was brought home in 1904 by the "Thor" from the following locality.

South of Iceland: 61° 30′ N. L., 17° 08′ W. L., young-fish trawl, 1800 m. wire out; 1 spec.

Distribution. The species was founded on two specimens taken in the Atlantic at 1° 22′ N. L., 26° 36′ W. L., 1500 fm. No other specimens are mentioned in the literature. The species is certainly not a bottom form; the specimen examined by me can scarcely have been in greater depths than ca. 400 fm., so that it was living pelagically in the intermediate layers.

Remarks. The "Thor" specimen is 60 mm. long. The carapace is greenish, lighter or darker chiefly according to the colour of the tissues underneath. The dorsal aspect of the first three abdominal segments is gray-green, the lateral surfaces much lighter. The carapace is furnished with a high, sharp keel along the whole length of the median line; the front part of this keel and the rostrum together with 10 dorsal spines, the rostrum which is somewhat bent upwards with 1 spine, at the middle of the lower margin; the rostrum is more strongly bent upwards that Bate's fig. 5 shows. The lateral keel of the carapace begins a little behind the orbital margin, continues right to the posterior margin and is very obvious. The first and second abdominal segments have no dorsal keel, the four following have a sharp dorsal ridge along their whole length and on the 4th to the 6th the ridge runs out into a fairly small spine. The telson has 3 small spines on the sharp distal section of each of the two ridges; the truncated end has 5 spines, of which the lateral pair are long, the three others

fairly short. — There is no doubt that the specimen belongs to *A. brevirostris;* there was no reason for Bate to consider the one of his two specimens as a variety.

74. Pasiphaë tarda Kr.

! 1845. Pasiphaë tarda Krøyer, Naturhist. Tidsskr., Ny R., 1. B., p. 434.
1846. — — Krøyer, Voy. en Scand., Crust., Pl. I, A. B. a—o.
! 1868. — norvegica M. Sars, Nyt Mag. for Naturv. B. 15, p. 282, Pl. I—V, Fig. 65—86; Pl. V, Fig. 81, 87—90.

Occurrence. The "Ingolf" has taken this species at 5 stations.

Davis Straits: St. 28: 65° 14′ N. L., 55° 42′ W. L., 420 fm., temp. 3·5°; fragments of 3 spec.

West of Iceland: St. 97: 65° 28′ N. L., 27° 39′ W. L., 450 fm., temp. 5·5°; 1 spec.

South-West of Iceland: St. 81: 61° 44′ N. L., 27° 00′ W. L., 485 fm., temp. 6·1°; 1 spec.

North of East Iceland: - 126: 67° 19′ — 15° 52′ — 293 — — ÷ 0·5°; 1 spec.

South of Jan Mayen: - 116: 70° 05′ — 8° 26′ — 371 — — ÷ 0·4°; 4 —

Krøyer founded the species on two specimens from the southernmost part of West Greenland. In 1904 it was taken by the "Thor" at no fewer than 9 localities, namely, at 3 places west of Iceland from 65° to ca. 65½° N. L., 27° 10′ to 28° 10′ W. L., young-fish trawl, 740, 763 and 1240 meters wire out; north of east Iceland at 67° 19′ N. L., 17° 55′ W. L., young-fish trawl, 800 meters wire out; at 3 places south of Iceland, young-fish trawl, 100, 800 and 1800 meters wire out; lastly, twice south-west of the Færoes, young-fish trawl, 820 and 900 meters wire out; a number of specimens were taken south-west of the Færoes, at 61° 7′ N. L., 9° 33′ W. L., 425—460 fm., by the "Michael Sars". Ortmann mentions one specimen taken in the vertical net, 0—600 meters, not far from the "Ingolf" station 81.

Distribution. In the North Sea one specimen has been taken off northern Jutland on the surface (Meinert); in the Skager Rak it is fairly common pelagically in deeper layers ("Thor"); it occurs along the south and west coasts of Norway from Christiania Fjord "at any rate to Lofoten" (G. O. Sars), it has later been taken even at Malangen, 69° 33′ N. L. (Nordgaard). It has also been taken in the Norwegian Sea far to the west of Norway at 3 stations with very great depths and bottom-temperatures from ÷ 1·1° to ÷ 1·3° (G. O. Sars), lastly in the vertical net at 3 places from 73° to 73½° N. L., 2° to 2° 50′ W. L. (Ohlin). S. I. Smith has seen specimens from places off the east coast of America, Massachusetts, where it goes no further south than Cape Cod. Lo Bianco states that he has seen specimens from a number of localities in the Mediterranean off the west coast of Italy, but some of his determinations of Crustacea are not trustworthy.

The species is pelagic as supposed by Sars; it lives often, perhaps as a rule, in depths from 150 to 300 fm., but can also swim much nearer the surface and apparently goes still deeper down sometimes. I think however that it always keeps to water-layers with temperature above 0°; this agrees with the "Ingolf" stations 28, 97 and 81, with almost all the "Thor" localities and a number of the others. In the Norwegian Sea it goes in my opinion with the warm surface-current towards the north and north-west, but does not go down into the lower layers with temperatures below 0°.

Remarks. The largest of the specimens taken by the "Ingolf", from St. 116, is 96 mm. long; a female with eggs came from 61° 7′ N. L., 9° 33′ W. L. (Bergen Museum) and measured 143 mm. from tip of rostrum to end of telson.

75. **Parapasiphaë sulcatifrons** S. I. Smith.

1884. Parapasiphaë sulcatifrons S. I. Smith, Rep. Comm. Fish and Fisher. for 1882, p. 384, Pl. V, fig. 4; Pl. VI, figs. 1—7.

Occurrence. The "Ingolf" has once taken this beautiful form.

West of Iceland: St. 91: 64° 44′ N. L., 31° 00′ W. L., 1236 fm., temp. 3·1°; 1 spec.

The locality lies midway between Greenland and the west coast of Iceland.

In 1904, the species was twice taken by the "Thor", namely,

South of Iceland: 61° 34′ N. L., 19° 05′ W. L., 2160 m., young-fish trawl, 1800 m. wire out; 9 spec.

— - — 61° 30′ — 17° 08′ — ? m. — — 1800 m. — 15 —

Distribution. The species was previously known only from the east coast of America from 35° 12′ N. L. to 41° 53′ N. L.; the depths varied from 515 to 2949 fm. It is extremely probable however that this form is never a bottom-animal, but that the larger specimens live pelagically in deep water, the smaller often in less depths; the specimens taken by the "Thor" were not in greater depths than at most 400 fm., that is, nearer the surface than the bottom.

Remarks. The "Ingolf" specimen is 75 mm. long; the largest of the other specimens is only 45 mm. and the other 23 smaller to quite small; some of them are really only larvæ with rudimentary abdominal limbs.

76. **Hymenodora glacialis** Buchh.

1874. Pasiphaë glacialis Buchholz, Zweite Deutsche Nordpolarfahrt, B. II, p. 279, Taf. I, Fig. 2.

! 1885. Hymenodora glacialis G. O. Sars, Norske Nordhavs-Exped., Crust. I, p. 35, Pl. IV.

Occurrence. It has been taken by the "Ingolf" at 16 stations.

North of East Iceland: St. 125: 68° 08′ N. L., 16° 02′ W. L., 729 fm., temp. ÷ 0·8°; 1 spec.

South of Jan Mayen: - 113: 69° 31′ — 7° 06′ — 1309 — — ÷ 1·0°; 6 —

— - — - 117: 69° 13′ — 8° 23′ — 1003 — — ÷ 1·0°; 12 —

— - — - 118: 88° 27′ — 8° 20′ — 1060 — — ÷ 1·0°; 2 —

— - — - 112: 67° 57′ — 6° 44′ — 1267 — — ÷ 1·1°; 8 —

North-East of Iceland: - 119: 67° 53′ — 10° 19′ — 1010 — — ÷ 1·0°; 6 —

— - — - 120: 67° 29′ — 11° 32′ — 885 — — ÷ 1·0°; 9 —

— - — - 111: 67° 14′ — 8° 48′ — 860 — — ÷ 0·9°; 3 —

— - — - 110: 66° 44′ — 11° 23′ — 781 — — ÷ 0·8°; 1 —

East of Iceland: St. 101: 66° 23′ N. L., 12° 05′ W. L., 537 fm., temp. ÷ 0·7°; 1 spec.

— - — - 102: 66° 23′ — 10° 26′ — 750 — — ÷ 0·9°; 9 —

— - — - 103: 66° 23′ — 8° 52′ — 579 — — ÷ 0·6°; 3 —

— - — - 104: 66° 23′ — 7° 25′ — 957 — — ÷ 1·1°; 11 —

— - — - 105: 65° 34′ — 7° 31′ — 762 — — ÷ 0·8°; 11 —

North of the Færoes: St. 139: 63° 36′ N. L., 7° 30′ W. L., 702 fm., temp. ÷ 0·6°; 1 spec.

— - — - 140: 63° 29′ — 6° 57′ — 780 — — ÷ 0·9°; 7 —

This species has never been taken at West Greenland. On the other hand, I have seen a specimen from the south of Iceland: 62° 11′ N. L., 19° 36′ W. L., 1010—1145 fm., temp. (in 1010 fm.) 2·75°

("Thor"). Norman gives it from the Færoe Channel: 60° 3′ N. L., 5° 51′ W. L., 540 fm., temp. ÷ 1·4° It was taken three times by the 2nd Amdrup Expedition: several half-digested specimens in the stomach of *Procellaria glacialis* from 69° 51′ N. L., 11° 18′ W. L., thus between Iceland and Jan Mayen; also in the stomach of the same species of bird from $74^1/_3$° N. L., $9^2/_3$° W. L., thus far to the north of Jan Mayen and just as far from East Greenland; and at 74° 12′ N. L., 12° W. L. one specimen "in ice hemmed in between ice-blocks". The species was founded on a specimen taken at the surface of the sea at ca. 74° N. L. "in beträchtlicher Entfernung von der Grenze des Packeises"; it has also been taken at 72° 42′ N. L. between Greenland and Jan Mayen, 1064 fm., and off Kaiser Franz Joseph Fjord (a little north of 73° N. L.), 133 fm. (Ohlin).

Distribution. The species was taken by the Norwegian North-Atlantic Expedition at 14 stations, all belonging to the cold area of the Norwegian Sea; the most southerly of these stations was at 63° 5′ N. L., the most northerly west of Spitzbergen at 79° 59′ N. L., the depths varied from 452 to 1861 fm. A specimen was also taken in the stomach of a bottom-fish, *Lycodes frigidus* Coll., at a station west of Spitzbergen in 1333 fm. depth and another in the stomach of another deep-water fish, *Raja hyperborea* Coll. It is noted by Ohlin and Birula from several stations in the same area, at three of these it was taken in the vertical net in depths from 0—2000, 0—2700 and 0—3000 meters. On the east coast of America it has been taken four times between 37° 12′ N. L. and 42° 48′ N. L., depths from 826 to 2949 im. (Smith, M. Rathbun). It is also given from the Bering Sea south of the Pribiloff Islands, 1401 fm., and from a place east of Prince of Wales Island, Alaska, 1569 fm. (M. Rathbun). According to Faxon and M. Rathbun it has been taken three times in the Gulf of California, 857, 905 and 1208 fm.; lastly, according to Faxon in the Gulf of Panama, 1832 fm., and off Ecuador, 1740 fm.

G. O. Sars l. c. writes concerning *H. glacialis:* "According to its whole organisation this form must seemingly be considered to lead a kind of half pelagic life, in other words, I have reason to believe that it is not... very much bound to the bottom, but swims free up in the water. Yet the rudimentary condition of the eyes indicate with certainty that its habitat is chiefly in the deeper water-layers, which also is fully confirmed by the observations made on our expedition". According to all available information the species must be pelagic and its central region of distribution the cold area of the Norwegian Sea; as it was twice taken in the stomach of bottom fish from great depths it can thus go down to over 1300 fm.; as it was twice taken in the stomach of birds and once on the surface it is obviously sometimes up in the surface-layers between 0 and 10 fm. But its geographical distribution is so remarkable that I am quite unable to give any reasonable explanation of it. Miss M. Rathbun, who is known often to set up a number of species very near to one another, has informed me that she has seen specimens from Ecuador, Gulf of California, Bering Sea, Alaska and Færoe Channel and considers them all of the same species, so that an error in determination is scarcely probable.

Remarks. I have endeavoured in vain to find some difference between my large material from the Norwegian Sea and the specimen taken south of Iceland, which might countenance the view that the last-mentioned belonged to another species. — My largest specimen (from "Ingolf" St. 103) is only 68 mm. long; Sars gives 83 mm. as the greatest length, but perhaps he measured his specimens from the tip of the antennal squama instead of from the tip of the rostrum.

77. **Gennadas elegans** S. I. Smith.

! 1882. Amalopeneus elegans S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, No. 1, p. 87, Pl. XIV, figs. 8—14, Pl. XV, figs. 1—15.

1903. — — Calman, Ann. & Mag. Nat. Hist., Ser. 7, Vol. XI, p. 416.

1906. Gennadas elegans Bouvier, Bull. Musée Océan. Monaco, No. 80.

Occurrence. The "Ingolf" has brought home this species from 8 stations.

Davis Straits: St. 25: 63° 30′ N. L., 54° 25′ W. L., 582 fm., temp. 3·3°; 2 spec.

West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm., temp. 0·3°; 2 spec.

— - — - 11: 64° 34′ — 31° 12′ — 1300 — — 1·6°; 1 —

South-West of Iceland: St. 83: 62° 25′ N. L., 28° 30′ W. L., 912 fm., temp. 3·5°; 1 spec.

South of Iceland: St. 67: 61° 30′ N. L., 22° 30′ W. L., 975 fm., temp. 3·0°; 1 spec.

— - — - 69: 62° 40′ — 22° 17′ — 589 — — 3·9°; 1 —

— - — - 40: 62° 00′ — 21° 36′ — 845 — — 3·3°; 1 —

East of Iceland: - 105: 65° 34′ — 7° 31′ — 762 — — 0·8°; 1 —

In Malac. Groenl. it is mentioned that a specimen was taken in a fish at Sukkertoppen, a colony in West Greenland at 65° 25′ N. L. In 1903 and 1904 it was taken five times by the "Thor". Four of these stations are in the deep water south of Iceland, from 62° 47′ N. L. to 61° 30′ N. L., 19° 36′ W. L. to 15° 03′ W. L.; at three of these stations at least it was taken pelagically in the young-fish trawl with 1800 to 1950 meters wire out; the fifth station lies "West of Iceland: 65° 00′ N. L., 28° 10′ W. L., young-fish trawl, 1000 meters wire out (depth of sea 1240 meters)". Concerning St. 105 see under distribution.

Distribution. This species has been taken off the east coast of North America at localities lying between 41° 13′ N. L. and 31° 41′ N. L.; the depths were from 372 to 2369 fm. (Smith). One specimen was taken at 52° 18′ N. L., 15° 53′ W. L. with the pelagic net sunk to 1410 fm. (Calman). Ortmann states that it was taken in the Sargasso Sea with a closing net from 690—800 fm., and also south of Cape Verde Islands in a vertical haul from 0—213 fm., but whether his specimens really belonged to *G. elegans* or at least some of them to any of the species later established by Bouvier it is impossible to say. Bouvier says on the distribution: Atlantique, Méditerranée.

This species is not a bottom-form but lives pelagically, as a rule certainly in the deeper layers, sometimes in higher layers. Bate has already expressed the same opinion regarding the genera *Gennadas* and *Benthesicymus*. It is probably distributed throughout the deeper parts of the Atlantic, but it is lacking in the sea between Norway and Greenland—Iceland—the Færoes. As mentioned above a specimen has indeed been taken in that sea at St. 105, and though this is in all probability correct, it does not show in my opinion that the species lives in the cold area; the specimen must have been carried there by the Gulf Stream.

Remarks. The genus *Gennadas* greatly needs revision, and it is to be hoped that Prof. Bouvier will examine the "Challenger" specimens and more fresh material from the Indian Ocean and the Pacific. Ortmann and especially Calman have remarked on the lack of agreement and the difficulties in connection with the descriptions of the gills in Smith, Bate and Alcock. It may be added

that I have examined the gills in many of my specimens and found them agreeing with the formula given by Smith (l. c., p. 86).

78, **Sergestes arcticus** Krøyer.

1856. Sergestes arcticus Krøyer, Overs. Kgl. Danske Vid. Selsk. Forh. i 1855, p. 27.
! 1859. — — Krøyer, Kgl. Danske Vid. Selsk. Skrifter, 5. R., Naturv. og mathem. Afd., B. 4, 1859, p. 240; Tab. III, Fig. 7 a—g, Tab. V, Fig. 16.
1875. — Meyeri Metzger, Jahresber. Comm. zur wiss. Untersuch. der Deutschen Meere in Kiel für die Jahre 1872, 1873, p. 302, Tab. VI, Fig. 7.
1882. — arcticus S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, No. 1, p. 96, Pl. XVI, fig. 4.
1886. — — S. I. Smith, Rep. Comm. Fish and Fisher. f. 1885, p. 696, Pl. XX, figs. 1, 2.
1888. — magnificus Chun, Bibliotheca Zool., B. 1, p. 33, Taf. IV, Fig. 4 & 5.
! 1897. — arcticus H. J. Hansen, Proc. Zool. Soc., London f. 1896, p. 949, 954—56.
1903. — — H. J. Hansen, Proc. Zool. Soc. Lond. f. 1903, p. 60, Pl. XII, figs. 1 a—1 c.

Occurrence. The "Ingolf" has taken this species four times.

West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm., temp. 0·3°; 2 spec.
— - — - 9: 64° 18′ — 27° 00′ — 295 — — 5·8°; 3 —
South - — - 67: 61° 30′ — 22° 30′ — 975 — — 3·0°; 1 —
North of the Færoes: St. 140: 63° 29′ N. L., 6° 57′ W. L., 780 fm., temp. ÷ 0·9°; 1 spec.

Krøyer's original specimen was taken at West Greenland at "60° odd N. L.", from which it may be concluded that it was taken in the Davis Straits. In 1903 and especially in 1904 the "Thor" has frequently taken this species, at 15 stations in all, in at least almost all cases with the young-fish trawl far above the bottom. A short account of these catches may be given here. To the west of Iceland it was taken at 65° 20′ N. L., 27° 12½′ W. L., young-fish trawl, 870 meters wire out, and at 65° 00′ N. L., 28° 10′ W. L., 1000 meters wire out. South of Iceland it was taken a number of times at places between 22° 23′ W. L. and 17° 08′ W. L., the latitude varying between 63° 15′ and 61½°; the length of wire out was in two cases only 100 meters, in other cases 750—800 and 1800 meters. Two of the "Thor's" stations lie north of the Færoes (length of wire out, 1200 and 1500 meters), two of them were south-west of these islands (wire out in the one case, 820 meters).

Distribution. The species is noted from two places in the Irminger Sea at 60° N. L., to the south-west and west of West Iceland, likewise from two places west of the Orkney Isles, being taken all four times in a vertical net (Ortmann). On the west coast of Norway it goes north at least as far as Trondhjem Fjord (G. O. Sars). Further, it is common off the east coast of America between 41° 35′ N. L. and 33° 42′ N. L. in depths from 139 to 2516 fm. It is known from the western half of the Mediterranean; in the Atlantic it goes south to Montevideo and to 38° 5′ S. B., 12° E. L. (Hansen), lastly 3 of the specimens taken by the "Challenger" south of Australia, at 47° 25′ S. L., 130° 22′ E. L., 2150 fm., belong to this species (Hansen).

At a number of the "Thor's" stations, namely, where 800 meters wire at least were used and where consequently the young-fish trawl was in a depth of at least 150—200 fm., specimens were taken which were adult or of considerable size; the largest was taken where 1500 to 1800 meters wire

were used, whereas those taken with 100 meters wire out are but small and far from mature. The structure of *S. arcticus,* the good state of preservation of the specimens taken by the "Ingolf" and the observations mentioned of the "Thor" show clearly that the species is not a bottom-form, but lives pelagically; large to very large specimens are however never taken near the surface, and the largest are not met with, at least as a rule, above a depth of about 250 fm. and they descend probably a good deal lower. — The specimen taken by the "Ingolf" at St. 140 has certainly been carried by the Gulf Stream into the Norwegian Sea and has been taken in the warmer layers, as the species undoubtedly does not live at the great depths with temperatures below 0° in the cold area.

Remarks. In my two papers on *Sergestes* mentioned above, I have dealt with the characteristics of this species, its distribution, the list of synonyms and likewise some of its larval stages, of which one has been described as *Sergestes Rinkii* Kr. The largest "Ingolf" specimen came from St. 9 and measures 55 mm.

79. Sergestes robustus S. I. Smith.

! 1882. Sergestes robustus S. I. Smith, Bull. Mus. Comp. Zool., Vol. X, No. 1, p. 97, Pl. XVI, figs. 5—8 b.
1886. — — S. I. Smith, Rep. Comm. Fish & Fisher. for 1885, p. 697, Pl. XX, fig. 6.
1903. — — H. J. Hansen, Ann. and Mag. Nat. Hist., Ser. 7, Vol. XI, p. 480, figs. 6 & 7.
— — inermis H. J. Hansen, Ann. and Mag. Nat. Hist., Ser. 7, Vol. XI, p. 479, figs. 1—5 (barely half-grown specimen).

Occurrence. The "Ingolf" has not taken this species, but I have seen specimens from the following place.

South-West of the Færoes: 61° 08′ N. L., 9° 46′ W. L., 450 fm., 3 specimens taken by the "Michael Sars" ($^{14}/_{8}$ 1902) and belonging to the Bergen Museum.

Distribution. It has been taken at 59°49′ N.L., 9°46′ W. L. by the "Thor", at 52°4$^{1}/_{2}$′ N. L., 12° 27′ W.L. (Hansen), in the Mediterranean (Hansen) and at a number of places off the east coast of North America between 41$^{1}/_{3}$° and 34° 28′ N. L., in depths from 372 to 2574 fm. In the "Summary of the Deep-Sea Zoological Work of the Royal Indian Marine Survey Ship "Investigator" from 1884 to 1897", 1899, p. 30, Alcock writes concerning this species: "Off coasts of South-India and Ceylon 200—902 fathoms (common)"; but it is somewhat remarkable that he does not include it in his "Descriptive Catalogue of the Indian Deep-Sea Crust. Dec., Mac. and Anomura, 1901".

Remarks. The largest specimen from the locality mentioned was 60 mm. long when scarcely fully extended. The specimens agree very well with a specimen determined by Smith received from the U. S. Nat. Museum. The specimen from the "Thor" is 90 mm. long.

It appears from the list of synonyms, that I now consider the *S. inermis* founded by me in 1903 on a single not quite half-grown specimen as a young stage of *S. robustus* shortly after the larval period. I have come to this result from a study of a considerable material from the Monaco Museum, from E. Holt, and from the "Travailleur" and "Talisman". The reasons for my considering in 1903 the differences between an adult specimen of *S. robustus* and the specimen described as *S. inermis* to be specific differences, arose in the first place from the complete lack of transitional stages, and in the second from the fact that our Museum possesses some plump specimens, some of

which are in the *Mastigopus*-stages, others a little more advanced in development, and these I had taken to be the developmental stages of *S. robustus,* but according to my later observations these must belong to a species which is not known at any rate from the Atlantic.

In 1896 I founded *S. mediterraneus* on several specimens, in the largest of which the eyes were not yet black, while the others were *Mastigopus*-forms. In 1903 I included *S. mediterraneus* as a synonym under *S. dissimilis* Bate. It appears now that *S. dissimilis* is the *Mastigopus*-stage of *S. robustus,* so that intermediate stages have been described as *S. incertus* H. J. H. and as "the sub-adult stage" of *S. mediterraneus* H. J. H.

II. Order: *Euphausiacea.*[1]

Within the region, the fauna of which is dealt with here, only 10 species in all have been taken of this Order[2]. As nearly all have been so well described and figured that they can be recognised with certainty, my notes are made relatively fairly short, the more so as I intend in the near future to publish a monograph of the whole Order based on an extremely large material. Analytical figures etc. will be much more suited to such a monograph and of more use there than if they were given here.

1. **Thysanopoda acutifrons** Holt & Tatt.

1905. Thysanopoda pectinata H. J. Hansen, Bull. Mus. Océan., Monaco, No. 30, p. 16, Fig. 12 (nec *T. pectinata* Ortmann).

1905. — acutifrons Holt & Tattersall, Rep. Sea and Inland Fisheries of Ireland, 1902—1903, Part II, App. No. IV, p. 102 and 134 (immature specimens).

1905. — — H. J. Hansen, Bull. Mus. Océan. Monaco, No. 42, p. 22.

! 1906. — — Holt & Tattersall, Fisheries, Ireland, Sc. Invest. 1904, V, p. 8, Pl. I.

Occurrence. The "Ingolf" took this large species in the trawl at 4 stations:

West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm.; 1 spec.

— - — - 9: 64° 18′ — 27° 00′ — 295 —; 1 —

South-West of Iceland: St. 17: 62° 49′ N. L., 26° 55′ W. L., 745 fm.; 2 spec.

— - — - 83: 62° 25′ — 28° 30′ — 912 —; 2 —

[1] I see no reason for following Stebbing and call this order Thysanopodacea because the oldest of the genera has the corresponding name. If an author (in casu J. Boas) has set up a group as order — or family — given it a name and for that purpose used one of the genera of the group as basis, this name chosen by the author of the order or family has priority and should be maintained — unless the name of the genus in question must be dropped. Just as it is necessary (so far as it is possible within reasonable limits) to maintain the oldest names for species and genera, we must also go upon the same principle in retaining the oldest name for a family or order irrespective of how it was formed; in this way we have more stability than on any other method of procedure. It is another matter, that in forming a family it would be best to use immediately the oldest generic name as family name.

[2] Ortmann in his work on the Schizopoda of the Plankton-Expedition has stated that *Thysanopoda microphthalma* G. O. S. is present from the Irminger Sea (at 60° N. L.). According to the form and equipment of the antennæ as shown in the author's figure his determination is incorrect, and I think he has had small specimens of *T. acutifrons* Holt & Tatt. which is not rare in these waters.

It was also taken by the "Thor" in 1903 and 1904 at the following stations:

West of Iceland: 65° 20′ N. L., 27° 12½′ W. L., Young-fish trawl with 810 m. wire out (actual depth 720 m.).
— - — 65° 00′ — 28° 10′ — , — — — 1000 m. — (— — 1240 m.).
South of Iceland: 62° 10′ N. L., 19° 36′ W. L., (depth 1900—2150 m.).
— - — 61° 34′ — 19° 05′ — , — — — 1800 m. — (actual depth 2160 m.).
— - — 61° 30′ — 17° 08′ — , — — — 1800 m.
South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L.; (depth 900 m.).

Distribution. The species was founded in 1905 on specimens taken off the west coast of Ireland. It is mentioned above (footnote p. 84) that *Thysanopoda microphthalma* Ortm. (nec G. O. Sars) from the Irminger Sea at 60° N. L. is probably the young of this species. It was taken by the "Thor" in 1905 at three places: far to the south-west of the Færoes, west of the Hebrides and south-west of Ireland, each time in the young-fish trawl with respectively 1200, 1500 and 1000 meters wire out. The Prince of Monaco has taken several specimens at two stations to the west of France, the most southerly being at 46¼° N. L.; the apparatus was sunk to 1490 and 3000 meters. It was never taken on any of the numerous occasions, when the vertical net was used from 100 fm. to the surface or the young-fish trawl in similar small depths within the area mentioned under occurrence and distribution. To judge from the "Thor's" results it is clearly not rare in intermediate layers in depths from about 200 down to 400 or 450 fm.

Remarks. In the synonymy list it will be seen, that (in April 1905) I first gave a preliminary description of this species under an erroneous determination, but that this error was corrected later (in July), and at the latter place I then gave a detailed description of adult and half-grown specimens, and also indicated the differences between it and the nearly related *T. distinguenda* H. J. H. An elaborate description with fine figures was published in 1906 by Holt & Tattersall. The largest specimen comes from St. 83 "Ingolf" and measures 43 mm.

2. **Meganyctiphanes norvegica** M. Sars.

1857. Thysanopoda norvegica M. Sars, Forh. Skand. Naturf. syvende Møde i Christiania 1856, p. 169.
1886. Nyctiphanes — Koelbel, Die oesterr. Polarst. Jan Mayen, p. 48, Taf. III, Fig. 7—10.
! 1905. Meganyctiphanes norvegica Holt & Tattersall, Rep. Sea and Inland Fisheries of Ireland, 1902—1903, Part II, No. IV, p. 105 and 135, Pl. XVI.

Occurrence. The "Ingolf" took this species at numerous stations, most times in the trawl.
West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L.; 1 spec.
— - — - 9: 64° 18′ — 27° 00′ — 3 —
North of East Iceland: St. 126: 67° 19′ N. L., 15° 52′ W. L.; 1 spec.
South of Jan Mayen: - 116: 70° 05′ — 8° 26′ — 1 —
— - — - 112: 67° 57′ — 6° 44′ — 2 —
— - — - 111: 67° 14′ — 8° 48′ — 1 —
North-East of Iceland: - 120: 67° 29′ — 11° 32′ — 3 —
East of Iceland: St. 101: 66° 23′ N. L., 12° 05′ W. L.; 5 spec.

East of Iceland: St. 104: 66° 23′ N. L., 7° 25′ W. L.; 1 spec.
— - — - 105: 65° 34′ — 7° 31′ — 4 —
— - — - 106: 65° 34′ — 8° 54′ — 1 —
North-West of the Færoes: St. 3: 63° 35′ N. L., 10° 24′ W. L.; 1 spec.
North of the Færoes: St. 140: 63° 29′ N. L., 6° 57′ W. L.; 1 spec.
— - — - 138: 63° 26′ — 7° 56′ — 4 —
— - — - 141: 63° 22′ — 6° 58′ — 3 —

This species has never been taken in Baffin Bay, Davis Straits or waters south of Cape Farewell, nor to the north-west or north of Iceland except at the St. 126 mentioned: north of East Iceland. To the west, south-west and south of Iceland it was taken a number of times by the "Thor", which also found it in Røde Fjord on the east coast of Iceland; it has been taken by several investigators over the ridge between the Færoes and Iceland, and it is also common round the Færoes. It was taken by Ryder's expedition near Jan Mayen, from which it is also noted by Koelbel. Ohlin mentions it from two places at East Greenland, namely, 72° 42′ N. L., 14° 49′ W. L. and from a place a little further north off Kaiser Franz Joseph Fjord; Buchholz mentions it from Cape Wynn in 74° 30′ N. L., 19° W. L.

Distribution. From the Færoes this species extends southwards along the British Isles (several observers), it also occurs in the Atlantic off France (Norman, Hansen, Holt & Tattersall), off Portugal (Norman), near the Gorringe Bank oft Gibraltar (Hansen) and in the western part of the Mediterranean at least to Messina (Lo Bianco, Hansen). It was next taken in the Kattegat (Intern. Explor.), Skager Rak (Metzger, Meinert), at Bohuslän (Goës), along the whole coast of Norway from Christiania Fjord to Vadsø in East Finmark (G. O. Sars), in the White Sea (Jarzynsky), in the Barents Sea (Breitfuss), at 75° N. L., 12° E. L. (Goës), lastly in the North Polar Sea by the "Fram" at ca. 81° N. L., 124° E. L. On the east coast of North America it has been found in the Gulf of St. Lawrence, at Nova Scotia, in Massachusetts Bay and as far to the south as ca. 40° N. L. Richters gives it with a query from the Bering Sea, but this determination is certainly extremely doubtful. Holt & Tattersall in 1905 and 1906 contribute to our knowledge of the distribution of the species in bathymetric regard; extremely important information on the same theme is given by S. I. Smith (1879) and G. H. Fowler (1905). I am not able to add to our knowledge in this regard, but may note, however, that the species was twice taken (only 1 spec. each time) in the so-called cylinder-net, an apparatus often towed near the surface by the "Ingolf" when steaming at its usual rate.

Remarks. I have arrived at the result that Holt & Tattersall's genus *Meganyctiphanes* ought to be accepted. The two authors pointed out an excellent generic difference in the female sex between this new genus and *Nyctiphanes* G. O. Sars; I can add that in the male the clasping organs of the first pair of pleopoda differ exceedingly from each other in the two genera.

3. **Rhoda inermis** Krøyer.

1846. Thysanopoda inermis Krøyer, Voy. en Scand., Crust., Pl. 7, figs. 2, a—t.
! 1882. Euphausia inermis G. O. Sars, Forh. Vid. Selsk. Christiania for 1882, Nr. 18, p. 51, Tab. I, Fig. 15.

Occurrence. The "Ingolf" has taken this species at 10 localities.

West Greenland: Godthaab Fjord, a small ebb pool; 1 specimen.

West of Iceland: St. 9: 64° 18′ N. L., 27° 00′ W. L., Trawl, 295 fm.; 1 spec.

North-East of Iceland: St. 121: 66° 59′ N. L., 13° 11′ W. L., Vertical net, 100—0 fm.; 3 spec.

East of Iceland: St. 103: 66° 23′ N. L., 8° 52′ W. L., Vertical net, 100—0 fm.; 2 spec.

— - — - 105: 65° 34′ — 7° 31′ — Trawl, 762 fm.; 1 spec.

— - — - 58: 64° 25′ — 12° 09′ — Plankton net, 100—0 fm; 3 spec.

South-East of Iceland: St. 57: 63° 37′ N. L., 13° 02′ W. L., Trawl, 350 fm.; 1 spec.

— - — - 3: 63° 35′ — 10° 24′ — — 272 —; 2 —

North of the Færoes: St. 140: 63° 29′ — 6° 57′ — — 780 —; 1 —

— - — - 141: 63° 22′ — 6° 58′ — — 679 —; 1 —

In Malac. Groenl. this species is mentioned from West Greenland as taken at "Egedesminde and Ritenbenk" as also Godhavn; later it has been found at Jakobshavn (Traustedt); it thus goes northwards here at least to 69° 13′ N. L., perhaps to 69° 44′ N. L. A specimen is present from 59° N. L., 51° W. L., south-west from Cape Farewell. It was taken by the "Thor" and other investigators a number of times on the west, south and east of Iceland, and it appears likewise in the fjords, being taken in Skjálfandi on the north coast, in Mid Fjord, Seydis Fjord, Røde Fjord and Beru Fjord on the east coast. It was taken by the "Ingolf", as noted above, somewhat to the north of the Færoes, but has hitherto not been found to the west, east or south of these islands. It was taken by the 2nd Amdrup Expedition at Jan Mayen, from which it was already noted by Koelbel, also at ca. 73½° N. L., 4° W. L. and ca. 74⅓ N. L., 8½ W. L.; Ohlin gives it for several places along East Greenland between ca. 71½° and 73½° N. L., at the last-mentioned latitude in Kaiser Franz Joseph Fjord.

Distribution. The species has been taken at Shetland and twice at Scotland (Norman) going southward to ca. 55½ N. L. Further, it has been taken at several places in the North Sea and twice in the Channel's western end off the Scilly Islands and still more to the south towards the French coast (Gough). In the northern Kattegat it has been taken once (Meinert); it is extremely frequent "off the northern shores of Norway" (G. O. Sars), has been taken in the Kara Sea (Hansen), round about Spitzbergen both west and east side (Ohlin, Zimmer), as also at Franz Joseph Land (Stebbing). On the east coast of America it is known from the Gulf of St. Lawrence, Bay of Fundy and from there southward to Vineyard Sound (ca. 41⅓ N. L.) (S. I. Smith).

It is this species which according to G. O. Sars appears at Finmark in such masses, that it forms the chief food of the blue whale and sometimes the food of the green cod. It was twice taken by the "Thor" in the young-fish trawl with respectively 15 and 40 meters line out; it was taken 3 times by the "Ingolf" in the vertical net from 100 to 0 fm. It appears from these 5 catches and from the literature, that the species often lives in the upper water-layers, but it is impossible at present to say whether it lives as a rule or always in the open sea at a distance of less than 100 fm. from the surface.

4. **Rhoda Raschii** M. Sars.

1864. Thysanopoda Raschii M. Sars, Forh. i Vid. Selsk. Christiania for 1863, p. 83.

! 1882. Euphausia Raschii G. O. Sars, Forh. i Vid. Selsk. Christiania for 1882, No. 18, p. 51.

Occurrence. The "Ingolf" has only twice taken this species.

Davis Straits: St. 29: 65° 34′ N. L., 54° 31′ W. L., Trawl, 68 fm.; 2 spec.

— — - 28: 65° 14′ — 55° 42′ — Vertical net, 100—0 fm.; 1 spec.

On the west coast of Greenland it is known from Karajok Fjord, ca. 70° 20′ N. L. (Vanhöffen) and in Malac. Groenl. I have mentioned various localities in the region from ca. 70° to 64$^1/_3$′ N. L. It was taken by the "Thor" a number of times at Iceland, namely, from the north-west coast in Patrik Fjord, from the north coast in Øfjord and Skjálfandi, from the east coast in Røde Fjord; it is present also from Seydis Fjord on the same coast, taken with the previous species by Hallas; Ostenfeld has it from a spot south-west of Iceland. In the East Greenland waters it has only once been taken, at ca. 74° 20′ N. L., 15° W. L. (Buchholz).

Distribution. This species is further known from localities along both sides of Scotland (Norman). It was taken by the "Thor" several miles west of St. Kilda and twice in the Skagerak due south of Norway at 57° 52′ N. L. It was founded on specimens from the Christiania Fjord, and Sars states that he has taken it "now and then" on the west coast of Norway, but does not give the northern limits.

We know at present no more of the distribution of this species, which is probably much greater. We may believe that the gaps are partly due to its having been sometimes confused with or not separated from the previous species.

5. **Thysanoëssa longicaudata** Krøyer.

1846. Thysanopoda longicaudata Krøyer, Voy. en Scand., Crust., Pl. 8, figs. 1, a—f.

1882. Thysanoëssa tenera G. O. Sars, Forh. Vid. Selsk., Christiania, p. 53, No. 18, Tab. I, Fig. 19—20.

! 1905. — longicaudata Holt & Tattersall, Rep. Sea and Inland fisheries of Ireland, 1902—1903, Part II, App. no. II, p. 107 & 138, Pl. XV.

Occurrence. The "Ingolf" has taken this species at numerous places:

Davis Straits: St. 28: 65° 14′ N. L., 55° 42′ W. L., Vertical net, 100—0 fm.; 5 spec.

— — - 37: 60° 17′ — 54° 05′ — Surface; 4 spec.

South-West of Greenland: St. 22: 58° 10′ N. L., 48° 25′ W. L., Vertical net, 200—0 fm.; 14 spec.

West of Iceland: St. 91: 64° 44′ N. L., 31° 00′ W. L., Plankton net, 100—0 fm.; 1 spec.

South-West of Iceland: St. 78: 60° 37′ N. L., 27° 52′ W. L., Plankton net, 100—0 fm.; 1 spec.

— - — - 39: 62° 00′ — 22° 38′ — — 100—0 —; 1 —

— - — - 68: 62° 06′ — 22° 30′ — Vertical net, 100—0 —; 12 —

South of Iceland: St. 63: 62° 40′ N. L., 19° 05′ W. L., Vertical net, 100—0 fm.; 11 spec.

— - — - 54: 63° 08′ — 15° 40′ — — 100—0 —; 10 —

South-East of Iceland: St. 57: 63° 17′ N. L., 13° 02′ W. L., Vertical net, 100—0 fm.; 15 spec.

— - — - 47: 61° 32′ — 13° 40′ — — 100—0 —; 2 —

South of Jan Mayen: St. 117: 69° 13′ — 8° 23′ — — 100—0 —; 1 —

North-East of Iceland: - 120: 67° 29′ — 11° 32′ — — 100—0 —; 9 —

— - — - 121: 66° 59′ — 13° 11′ — — 100—0 —; 5 —

East of Iceland: St. 101: 66° 23′ N. L., 12° 05 W. L., Vertical net, 100—0 fm.; 1 spec.
— - — - 103: 66° 23′ — 8° 52′ — — 100—0 —; 13 —
— - — - 58: 64° 25′ — 12° 09′ — Plankton net, 100—0 —; 1 —
North of the Færoes: St. 138: 63° 26′ N. L., 7° 56′ W. L., Trawl, 471 fm.; 1 spec.
West of the Færoes: 63° 26′ N. L., 10° 47′ W. L., Surface; 2 spec.

The species is recorded from Karajok Fjord, ca. 70° 20′ N. L., on the west coast of Greenland (Vanhöffen), from Davis Straits at 62° 06′ N. L., 55° 56′ W. L. (Norman) and from the waters south-west of Greenland at 59° N. L. 51° W. L. (Hansen). It has many times been taken by various expeditions, especially by the "Thor" in 1904, in the waters round Iceland as also to the west and south of the Færoes. It was taken at Jan Mayen by the 2nd Amdrup Expedition and at 73½° N. L., 4° W. L.; finally by the Ryder Expedition at East Greenland at 70° 22′ N. L.

Distribution. The species is known from the Færoe Channel (Norman), Scotland (Norman), northern part of North Sea and west coast of Ireland (Holt & Tattersall). It is even noted from the Skager Rak (Intern. Explor.). G. O. Sars gives it from the west coast of Norway without indicating the southern limit, from Varanger Fjord and from 4 stations between Norway and Jan Mayen. It is also noted from Bear Island, from North-East Spitzbergen and north of Spitzbergen at 81° 20′ N. L. (Zimmer); it was taken by the "Fram" much further to the north of Spitzbergen at 84—84½° N. L.; further, north-east of Franz Joseph Land at ca. 84½° N. L., 72° E. L., lastly at ca. 80° N. L., 124° E. L. (G. O. Sars). It was taken on the German Plankton-Expedition not only in the direct line from the north point of Scotland to Cape Farewell, but also several times on the line from 60° N. L., 42° W. L. to near the southernmost corner of Newfoundland (Ortmann).

It was taken three times by the Plankton-Expedition in the cylinder net, thus near the surface, by the "Ingolf" twice near the surface and 15 times in depths between 100 and 0 fm. As a result of these numerous catches we are justified in concluding that the species is found as a rule in the upper water layers, either near the surface or at any rate not deeper than 100 fm. under this.

According to Holt & Tattersall the specimens from the west coast of Ireland differ in various small details from the Norwegian specimens, but the differences are so small that the authors do not even set up the Irish form — which they think resembles greatly the Færoe specimens — as a variety. Their observations with regard to the bathymetric occurrence of the Irish specimens do not agree, however, with the conclusions I have considered myself justified in drawing above.

6. Thysanoëssa neglecta Krøyer.

1846. Thysanopoda neglecta Krøyer, Voy. en Scand., Crust., Pl. 7, figs. 3 a—d.
! 1882. Thysanoëssa borealis G. O. Sars, Forh. Vid. Selsk. Christiania for 1882, p. 52, No. 18, Tab. I, Fig. 16—18.

Occurrence. This species was not taken by the "Ingolf", but the Copenhagen Museum possesses some specimens from 4 places lying within our area.

South-West Iceland: Skagi, 20 fm., "Thor" 1903; 1 spec.
— — : West of Geirfugleskjær, Young-fish trawl, with 100 m. wire out, "Thor" 1904; great quantity of specimens.

South-West Iceland: 63° 46′ N. L., 22° 56′ W. L., 80 fm., "Thor" 1904; some spec.

East Iceland: Mid Fjord, 40½—50 fm., "Diana"; 1 spec.

It is noted from West Greenland, Karajok Fjord in ca. 70° 20′ N. L. (Vanhöffen), but the specimen I have mentioned in Malac. Groenl. as coming from 59° N. L., 51° W. L. has proved on renewed examination to be a young *Rhoda inermis,* in which the eyes were to a certain degree divided into two portions.

Distribution. The species is also known from the Færoe Channel, Shetland, northern part of the North Sea and East Scotland (several observers), Skager Rak (Internat. Explor.), also from the west coast of Ireland (Holt & Tattersall), but Caullery's statement that it occurs in the Bay of Biscay is probably due to an erroneous determination. It is further known from the Norwegian west coast and Varanger Fjord (G. O. Sars), from Horn Sound at Spitzbergen (Zimmer) and finally has been found on the north-east coast of North America at Eastport, Maine (Norman). — Norman and Ortmann bring in as synonymous *T. longipes* Brandt from the Sea of Ochotsk and Zimmer follows them hesitatingly. But judging from Brandt's observation that spines are present on the upper posterior margin of some of the abdominal segments this reference is quite incorrect; through the kindness of Dr. A. Birula I have been able to examine a couple of Brandt's (extremely mutilated) type-specimens, which show, as stated by him, well-developed dorsal processes.

Remarks. A renewed examination of the very old and badly preserved specimens investigated by Krøyer has shown, that most of these in which the eyes are preserved belong to this species (which was, however, first well described by Sars under the name *T. borealis*), whilst some specimens, to judge from the eyes, belong to *Rhoda inermis.* Krøyer's figure is poor, and he has never given a description, but as most of the specimens seen by him belong to *T. borealis* I still keep Krøyer's name for the species. If Krøyer's name has to be scored out, the species according to Norman's synonymy list must be called *T. aberdonensis* Sim.

7. **Nematoscelis megalops** G. O. Sars.

1883. Nematoscelis megalops G. O. Sars, Forh. Vid. Selsk. Christiania for 1883, no. 7, p. 27.

! 1885. — — G. O. Sars, Challenger Rep., Zoology, Vol. XIII, p. 127, Pl. XXIII, figs. 5—10, Pl. XXIV.

1905. — — H. J. Hansen, Bull. Mus. Océan. Monaco, No. 30, p. 27.

Occurrence. The "Ingolf" did not find this species but it has been taken by the "Thor" in 1904 at 4 localities:

South-West Iceland: West of Geirfugleskjær, Young-fish trawl with 100 m. wire out; 1 spec.

West of the Færoes: 61° 49′ N. L., 14° 11′ W. L., — — — 800 m. — 1 —

South-West of the Færoes: 61° 21′ N. L., 10° 59′ W. L., — — — 180 m. — 7 — (4 ♀, 3 ♂).

— - — : 61° 15′ — 9° 35′ — — — — 900 m. — 6 — (5 ♀, 1 ♂).

Distribution. This oceanic species is known from the North Sea (Intern. Explor.), from the east coasts of Scotland and North England (Norman), Irish Sea and west of Ireland (Holt & Tattersall); in 1905 the "Thor" found it several times to the west and north-west of the Hebrides. It has a

wide distribution in the Atlantic and western Mediterranean (several observers and Copenhagen Museum). The Plankton-Expedition has taken it in the Irminger Sea at 60° N. L. and east of Newfoundland; it was also taken off Nova Scotia, off France, at the Azores as also between Buenos Ayres, Tristan d'Acunha and Cape of Good Hope, whilst it is still unrecorded from the part of the Atlantic lying between ca. 28° N. L. and 37° S. L. The Copenhagen Museum also has it from two places in the southern part of the Indian Ocean: 40° 8′ S. L., 52° E. L. and 40° 41′ S. L., 85° 22′ E. L. On the other hand I cannot accept Ortmann's note of its occurrence in the eastern Pacific as correct until further information is forthcoming.

The fact that the Copenhagen Museum has older material from no less than 12 widely separated places shows that the species comes up to the surface at any rate sometimes in the night, as the material has been collected for us by the captains of trading ships by means of a net towed after the ship. — G. H. Fowler (1905) gives a detailed report on the bathymetric distribution of the species in the Bay of Biscay; it was partly taken with an open vertical net, partly with a closing net and the results are "that the centre of distribution lay about 50 and 75 fathoms", that the species was also taken in 12 per cent. of the hauls near the surface and in the closing net as deep down as 750—500 fm. and in several intervening depths up to a haul in 150—50 fm.

Remarks. Males are much more rare than females. Sars has only seen females and neither Ortmann nor Holt & Tattersall say anything of males, which indicates that they have not taken specimens of this sex. As I have shown in the paper mentioned in the synonymy list, males differ in the most distinct manner from the females by lacking the very long and thin rostrum present in the latter. These males were taken by the "Thor", and neither in the older material of the Museum nor amongst over 20 specimens taken in 1904 by the Prince of Monaco are there any males.

8. **Nematobrachion boopis** Calm.

! 1896. Nematodactylus boopis Calman, Trans. Roy. Irish. Acad., Vol. XXXI, p. 17, figs. 19—28.
1905. Nematobrachion — Calman, Rep. Sea and Inland Fisheries of Ireland, 1902—1903, Part II, App. 4, p. 153, Pl. XXVI.

Occurrence. The "Ingolf" did not take this beautiful form, but it was found by the "Thor" at the following 6 stations.

West of Iceland: 65° 00′ N. L., 28° 10′ W. L., Young-fish trawl with 1000 m. wire out; 5 spec. (depth 1240 m.).
South - — 61° 34′ — 19° 05′ — — — — 1800 m. — 2 — (— 2160 m.).
— - — 62° 49′ — 18° 46′ — — — — 100 m. — 1 —
West of the Færoes: 61° 49′ N. L., 14° 11′ W. L., Young-fish trawl with 800 m. wire out; 3 spec.
South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., Young-fish trawl with 900 m. wire out; 2 spec.
— - — 61° 08′ — 9° 28′ — — — — 820 m. — 1 —

Distribution. In 1905 the "Thor" took this species 3 times west and north-west of the Hebrides, further, south-west of Ireland and west of North France: 6 times in all and only with the young-fish trawl, but the length of line out varied from 300 to 1500 meters. It was known earlier from the waters west and south-west of Ireland (Calman, Holt & Tattersall), also from a place west of France and from a number of stations within the triangular area: Gorringe Bank, the Azores and

the Canary Isles (Hansen). Ortmann enumerates it from the waters near Hawaii, but to judge from a preliminary examination of material from the Pacific I am inclined to think that the animals from this ocean must be referred to a hitherto unnamed species. As it is not present in the older though very large material in the Copenhagen Museum, which was all taken practically near the surface in the Atlantic etc., I believe we may conclude that it as a rule does not approach the surface, but according to the "Thor's" catches it must sometimes occur in depths between ca. 75 and 25 fm.

9. Stylocheiron maximum n. sp.

Description. While studying a rich material of "*Stylocheiron abbreviatum* G. O. Sars" from the Atlantic, the Indian Ocean and the Pacific, I discovered that it comprised two allied but very distinct species, one of which was *S. chelifer* Chun, while the other was either *S. abbreviatum* G. O. Sars or a species hitherto undescribed. *S. abbreviatum* has been established on "Challenger" specimens much less than half-grown; by the aid of Sars' figures and a couple of sketches kindly drawn by Dr. Calman for me from Sars' type I arrived at the opinion that *S. abbreviatum* is synonymous with *S. chelifer;* consequently it became necessary to give the new species a name, and *S. maximum* was chosen as appropriate. The discovery was made after the plates to this paper were finished; I will therefore only point out the two most conspicuous differences between *S. maximum* n. sp. and *S. abbreviatum* G. O. Sars (= *S. chelifer* Chun), postponing a more detailed account with figures to a subsequent occasion.

In adult and subadult specimens of *S. maximum* the eyes have the upper section slightly or at most a little smaller than the lower; besides, the fourth and fifth abdominal segments have no median dorsal tooth. In adult and subadult specimens of *S. abbreviatum* the eyes have their upper section much smaller than the lower, and the fourth and fifth abdominal segments each a conspicuous dorsal median tooth from the hind margin. In half-grown or still somewhat smaller specimens of *S. abbreviatum* the abdominal armature mentioned is feebly developed, and the upper section of the eyes is proportionately still smaller than in larger specimens; in small specimens of *S. maximum* the eyes have their upper section somewhat smaller as compared with the lower than in large specimens, but that section is yet conspicuously larger than in the other species.

S. maximum is even larger than *S. abbreviatum;* the specimen secured by the "Thor" is an adult male, measuring 23·5 mm. from the end of rostrum to the tip of telson.

Occurrence. The "Ingolf" has not taken this fine species, but it was brought home by the "Thor" in 1904.

West of the Færoes: 61° 49′ N. L., 14° 11′ W. L., Young-fish trawl with 800 m. wire out; 1 spec.

Distribution. Here it may be briefly stated that I have seen specimens of *S. maximum* both from the Atlantic and from the Indian Ocean. I am inclined to think that at least some of my predecessors (for instance Ortmann) have mixed up *S. maximum* with the other species.

10. Stylocheiron longicorne G. O. Sars.

1883. Stylocheiron longicorne G. O. Sars, Forh. Vid. Selsk. Christiania for 1883, no. 7, p. 32.

! 1885. — — G. O. Sars, Challenger Rep., Zool., Vol. XIII. p. 144, Pl. XXVII, fig. 5.

Occurrence. The "Ingolf" has not taken this species but it was twice found by the "Thor" in 1904.

South of Iceland: 63° 08′ N. L., 21° 30′ W. L., Young-fish trawl with 250 m. wire out; 1 spec.

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., Young-fish trawl with 1000 m. wire out; 2 spec.

Distribution. The species was twice taken to the west of the Hebrides by the "Thor"; it is frequent to the west and south-west of Ireland and in the Bay of Biscay (Holt & Tattersall), at the Azores and Canary Isles (Hansen), and in the Atlantic between 42° N. L. and 8° S. L. (Ortmann); it is not rare in the western Mediterranean (several observers) and was founded on a specimen taken south of the Cape of Good Hope. — As the species is quite lacking in the older material of the Copenhagen Museum it must occur rarely near the surface, though it has been taken there (Ortmann, Holt & Tattersall, etc.). Fowler (1905) gives a detailed account of its bathymetric occurrence in the Bay of Biscay; reference for details may be made to his paper.

Remarks. In the Monaco Bulletin No. 30 I have brought in *S. longicorne* as synonym to *S. Suhmii,* which last I thought was founded on not fully developed specimens. Later investigation of an immense material from various seas has shown me, that there are four nearly related species with long antennular peduncles, and therefore I must restore the name *S. longicorne,* but an account (with figures) of the four species is postponed to a paper in preparation.

III. Order: *Mysidacea.*

Within the region the fauna of which is treated here 35 species of this Order have hitherto been found. But, whilst I have seen specimens from this region of all the species of Decapoda and Euphausiacea (with exception of a single doubtful form), there are no fewer than 4 species of the Mysidacea noted in the following pages which are mentioned exclusively on other authorities.

The limits of the region dealt with, sources of the material, synonymy etc. have been mentioned in the introduction to the Malacostraca, to which reference may be made.

A. Suborder Lophogastrida.

1. Gnathophausia zoëa Will.-Suhm.

Pl. IV, figs. 3 a—3 e.

1875. Gnathophausia zoëa Willemoës-Suhm, Trans. Linn. Soc., Ser. 2, Vol. I, p. 32, Pl. IX, figs. 2—15.
! 1885. — — G. O. Sars, Challenger Rep., Zool., Vol. XIII, p. 44, Pl. VI, figs. 6—10.
— — willemoesii G. O. Sars, Challenger Rep., Zool., Vol. XIII, p. 38, Pl. V, figs. 1—6.

Occurrence. The "Ingolf" has taken this species 9 times.

Davis Straits: St. 25: 63° 30′ N. L., 54° 25′ W. L., 582 fm.; 1 spec.

West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm.; 1 spec.

— - — - 11: 64° 34′ — 31° 12′ — 1300 — 1 —

West of Iceland: St. 90: 64° 45′ N. L., 29° 06′ W. L., 568 fm.; 1 spec.
South-West of Iceland: St. 17: 62° 49′ N. L., 26° 55′ W. L., 745 fm.; 1 spec.
— - — - 83: 62° 25′ — 28° 30′ — 912 —; 1 carapace.
— - — - 18: 61° 44′ — 30° 29′ — 1135 —; 1 spec.
South of Iceland: St. 41: 61° 39′ N. L., 17° 10′ W. L., 1245 fm.; 1 spec.
West of the Færoes: St. 42: 61° 41′ N. L., 10° 17′ W. L., 625 fm.; 1 spec.

Further, it has been taken four times within our region by the "Thor", three of the times in the waters south of Iceland, whilst the fourth place was at 65° 00′ N. L., 28° 10′ W. L., i. e. in the Irminger Sea west of Iceland, yet a little more northerly than St. 90 "Ingolf". It was taken all four times in the young-fish trawl and the amount of wire out varied between 1000 to 1800 meters, so that the real depth in which the specimens were taken varied from ca. 200 to at most 450 fm., whilst the depth of water at the stations varies from ca. 750 to over 1000 fm.

Distribution. The "Thor" has taken the species to the west of the Hebrides and west of Brittany (both times in the young-fish trawl and length of wire out respectively 1500 and 500 meters). It is noted from several places in the northern temperate and tropical Atlantic (Sars, Caullery, Holt & Tattersall, Hansen, Ortmann), from several places in the Indian Ocean (Alcock), south of Amboina, in the Banda Sea (G. O. Sars' locality for *G. Willemoësii*), lastly from some places in the Pacific Ocean (G. O. Sars, Faxon, Ortmann).

To judge from the "Thor's" catches the species does not live at the bottom but in intermediate layers. A specimen taken with 500 meters wire out, thus in a depth of at most ca. 125 fm., is quite small and this is also the case with a specimen taken with 1000 meters wire out, whilst among the specimens taken with 1500 meters wire out there is one somewhat more than half-grown, and among those taken with 1800 meters wire out there is a large specimen. It seems to be the same here as with *Sergestes arcticus* and *S. robustus,* that small specimens are often at least found nearer the surface than the larger and that the wholly developed specimens are always only met with in deeper layers.

Remarks. The largest specimen is a female with marsupium (from "Ingolf" Stat. 17) measuring 90 mm. from tip of rostrum to end of telson, whilst a male (taken by the "Thor") is 86 mm. long; Sars' largest specimen was only 70 mm. The spine at the distal extremity of the squama of the antennæ usually reaches a little beyond this, but in the large female scarcely to the extreme end of the squama; the outer edge of the spine is smooth without crenulations, and I have not seen such an equipment of small teeth as is shown by Sars' fig. 9. The rostrum and especially the posterior process of the carapace are relatively longer in small than in large specimens, which last form a transition to *G. Willemoësii* G. O. S. as figured l. c. Pl. V, figs. 1—2. I believe that Ortmann is right in cancelling *G. Willemoësii* as founded on large specimens of *G. zoëa;* I have examined Sars' specimens of his *G. Willemoësii* in the British Museum (Natural History) but notes on these specimens are postponed to a future publication.

On Pl. IV I have represented (figs. 3 b and 3 c) the distal portion of both mandibles seen from above and (fig. 3 a) the same portion of the left mandible seen from below, also the left maxillula (fig. 3 d) and maxilla (fig. 3 e). The two last figures especially I believe to be of some interest, as they show the segmental structure of these appendages and from which joints the various lobes arise,

whilst the figures given by G. O. Sars and Coutière are either defective or incorrect. The description to the plate furnishes sufficient explanation for the understanding of these figures.

2. **Eucopia unguiculata** Will.-Suhm.

1875. Chalaraspis unguiculata Willemoës-Suhm, Trans. Linn. Soc., Ser. 2, Vol. I, p. 37—40, Pl. VIII.
1885. Eucopia australis G. O. Sars, Challenger Rep., Zool., Vol. XIII, p. 55, Pls. IX—X.
Only in part, whilst *E. australis* Dana is another species.
! 1905. — unguiculata H. J. Hansen, Bull. Mus. Océan. Monaco, No. 42, p. 3.

Occurrence. The "Ingolf" has taken this species at 8 localities:
Davis Straits: St. 36: 61° 50′ N. L., 56° 21′ W. L., 1435 fm; 1 spec.
South of Greenland: St. 21: 58° 01′ N. L., 44° 45′ W. L., 1330 fm; 2 1/2 spec.
West of Iceland: St. 12: 64° 38′ N. L., 32° 37′ W. L., 1040 fm.; ca. 20 spec.
— - — - 11: 64° 34′ — 31° 12′ — 1300 —; 1/2 spec.
South-West of Iceland: St. 17: 62° 49′ N. L., 26° 55′ W. L., 745 fm.; 3 spec.
— - — - 83: 62° 25′ — 28° 30′ — 912 —; 5 —
South of Iceland: St. 40: 62° 00′ N. L., 21° 36′ W. L., 835 fm.; 3 spec.
— - — - 49: 62° 07′ — 15° 07′ — 1120 —; 1/2 spec.

The species has been taken by the "Thor" three times to the south of Iceland and once south-west of the Færoes; for two of these the apparatus used was the young-fish trawl with 1800 meters wire out.

Distribution. As Sars has mixed together 3 species (*E. australis* Dana, *E. unguiculata* Will.-Suhm, and *E. sculpticauda* Faxon) in his description of *E. australis* and as later authors have not described the specimens examined by them I shall not follow the literature in speaking of the distribution but base my statements on my own observations. In 1905 it was twice taken by the "Thor" west of the Hebrides with 1500 meters wire out; I have seen numerous specimens from the western Mediterranean, from the Atlantic round the Azores and Canary Islands, from various places in the Indian Archipelago and from parts of the Pacific Ocean. To judge from the catches of the "Thor" and of G. H. Fowler (1905) this species is always pelagic in intermediate layers; it never comes near the surface.

Remarks. In the paper cited above I have indicated the characteristics of this species which distinguish it from the real *E. australis* Dana and from another large form as yet unnamed, and also discussed the synonymy. —

Adult specimens are as a rule only ca. 27—30 mm. in length, but two specimens of quite unusual size, viz. a female with marsupium 37 mm. long and a male 38 mm., occur amongst the considerable material from the "Ingolf" St. 12.

3. **Eucopia sculpticauda** Faxon.

1893. Eucopia sculpticauda Faxon, Bull. Mus. Comp. Zool., Vol. XXIV, p. 218.
! 1895. — — Faxon, Mem. Mus. Comp. Zool., Vol. XVIII, p. 219, Pl. K, figs. 2, 2 d, Pl. LIII, figs. 1—1 d.
1905. — — H. J. Hansen, Bull. Mus. Océan. Monaco, no. 30, p. 7, fig. 4.

Occurrence. The "Ingolf" has only once taken this species.

South-West of Iceland: St. 83: 62° 25′ N. L., 28° 30′ W. L., 912 fm.; 1 spec.

Distribution. The "Thor" took a specimen west of the Hebrides: 57° 46′ N. L., 9° 55′ W. L., young-fish trawl with 1500 meters wire out, thus at a depth of at most 350 to 400 fm. The species was next known according to the literature from the triangular area between Gibraltar, the Azores and the Canary Islands (Hansen), from the Indian Ocean (Alcock), the Fiji Islands (Ortmann), lastly the Galapagos Islands in the tropical Pacific, the Gulf of Panama and off Central America (Faxon). — It has thus an extensive distribution and must be referred to the mesoplankton like the previous species.

B. Suborder Mysida.

4. Hansenomysis Fyllæ H. J. H.

Pl. IV, figs. 4 a—4 k.

1887. Arctomysis Fyllæ H. J. Hansen, Vid. Medd. Naturh. Foren. Kjøbenhavn, for 1887, p. 210, Tab. VII, Fig. 5—5 l.

1893. Hansenomysis Fyllæ Stebbing, Intern. Scient. Series, Vol. 74, p. 268.

Occurrence. The "Ingolf" has twice taken this species.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 2 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 1 —

Further, the "Fylla" has taken it in the Davis Straits, Admiral Wandel and the "Thor" near the Færoes; the localities are as follows:

Davis Straits: 65° 35′ N. L., 54° 50′ W. L., 80 fm., stones with Balani; 1 spec. (my type spec.).

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 450—500 fm.; 10 spec.

— - — 61° 23′ — 5° 04′ — 255 fm., temp. 0°; 1 spec.

Distribution. This form is only known as yet from the localities mentioned.

Characteristics of the Species. The genus and species were founded on a single, adult, damaged female; as I now possess fairly good material, additional details to my previous description may be given here.

In well-preserved specimens the carapace shows a certain and sometimes very considerable solidity with characteristic, well-marked furrows as represented in fig. 4 a. The central two-thirds of the anterior margin seen from above (fig. 4 c) is flatly convex, seen from the side considerably bent upwards; each lateral portion forms a tolerably short wing, the anterior lateral margin of which is somewhat oblique, considerably convex above and reaching further forward than the central part of the carapace. Posteriorly the carapace is somewhat emarginate so that the hind upper part of the fifth thoracic segment is uncovered; the sixth and seventh thoracic segments (fig. 4 a; VI, VII) are completely uncovered and firmly chitinised. The head projects very considerably forwards in front of the carapace; seen from the side its upper profile is very concave, so that the front end projects strongly forwards and upwards (fig. 4 a); seen from above the front end is considerably convex (fig. 4 c).

The eyes (o) are seen along the hinder portion of the lateral margins of the projecting part of the head. Each eye is a short plate, ca. 3 times as broad as long with the concave terminal margin looking obliquely forwards and outwards, and its posterior corner especially is much produced outwards (fig. 4 a); any trace of visual elements is quite lacking. — The peduncle of the antennulæ is a little shorter and distally a trifle thicker in the males than in the females; in the female (fig. 4 c) the three joints decrease slightly in length from behind forwards whilst in the male (fig. 4 b) the two distal joints are of equal length. In both sexes the outer flagellum seems but slightly longer than the inner one (I have not seen adult specimens with both flagella quite unbroken), and both are fairly short; in the female both flagella are almost of equal thickness, whilst in the male (fig. 4 b) the 13 proximal joints of the upper, outer flagellum form an extremely thickened portion the distal third of which, however, tapers evenly towards the end. — The squama is between 5 and 6 times as long as broad, tapering outwards with rounded apex, with setæ along both margins and further 5 to 6 obvious strong spines distributed along the outer margin. — The telson (fig. 4 i) reaches very little beyond the inner ramus of the uropods; its lateral margins are almost parallel for barely two-thirds of the length and then the breadth narrows abruptly, each margin being divided into 4 sections of about equal length by 3 small notches each of which has a thick and very long spine; the end which is thus short is flatly rounded and provided with a pair of thick long spines separated by a shorter spine. In front of the second of the very long lateral spines there is a short spine, between the second and third long spines 4—6 smaller spines increasing gradually in length backwards, between the third long lateral spine and the long terminal spine 6 shorter spines increasing gradually in length backwards (fig. 4 k)[1]. — The pleopods in the female are as usual unbranched, but they increase greatly in length from before backwards, so that the fourth pair is a little longer than the fifth segment, the fifth pair however but little longer than the sixth segment, which is not much shorter than the two previous segments taken together. In the male all the pleopoda are of about equal length (figs. 4 d—4 h), but a little shorter than usual in forms of this suborder and they differ considerably in several points from the usual type. The peduncle increases a little in length from before backwards; the outer ramus is almost similar in all pairs, consisting of a long joint divided obliquely at a little distance from its base and ca. 8 (on the fifth pair) short joints; this portion has two longitudinal rows of fairly short but strong, non-plumose setæ. The inner ramus consists on the first pair (fig. 4 d) of only a single oblong joint. On the second to the fourth pairs the inner ramus is well-developed and increases a little in length backwards, being on the second pair (fig. 4 e) a little shorter, on the fourth pair (fig. 4 g) a little longer, than the outer ramus; in all three pairs the inner ramus consists of a long, unjointed basal portion and a distal portion divided into 7 or 8 short joints with similar setæ as on the outer ramus, but the proximal unjointed portion increases in length from before backwards and on the second pair is a little shorter, on the fourth pair somewhat longer, than the jointed distal portion. On the fifth pair (fig. 4 h) the unjointed portion is, however, a little longer than the whole outer ramus and a jointed portion is lacking. Further, the setigerous equipment on the unjointed portion of the inner ramus offers some interest, as almost all the setæ are tolerably transparent and

[1] This description of the telson has been based on the males as the telson in all my adult females was greatly mutilated. There is however scarcely any sexual difference in this organ.

comparatively speaking not thin, and are divided into several joints; also the very long setæ on the outer margins of the first to the fourth pair and the apical and subapical setæ on the fifth pair are placed on protuberances as on a kind of basal support. The characteristic distribution of the setæ and the relative position of the setigerous groups on the inner branches can be seen from the figures.

The females with marsupium measure 16—17 mm., the males 13 mm. in length.

Family Petalophthalmidæ. — In 1887 I founded this species under the name *Arctomysis Fyllæ* n. gen., n. sp. and wrote: "I believe that my new genus should be placed near the genus *Petalophthalmus* Will.-Suhm and that these two genera should form together a family by themselves within the order of the Mysidæ". In 1893 Stebbing gave it the name *Hansenomysis*, as the generic name used by me had been applied by Czerniavsky to a genus which was, however, quite unmaintainable (see below p. 102). In 1895 Faxon described in detail two genera founded by him in 1893 and thus writes: "*Petalophthalmus, Scolophthalmus, Hansenomysis,* and *Ceratomysis,* form a natural group of genera characterized by the development of seven pairs of incubatory lamellæ in the female (the anterior pair sometimes rudimentary), the absence of an exopod from the maxillipeds, the outgrowth of a large, porrect lobe from the inner margin of the merus of the gnathopods, and the imperfect development of the carapace, which leaves the last two segments of the cephalo-thorax free". Seven pairs of marsupial lamellæ are also found, as Faxon also remarks, in *Borcomysis,* but in no other genus of this suborder, where only three or fewer pairs of lamellæ are met with; on the other hand, the other characters summed up by Faxon are exclusively peculiar to the genera named, which I therefore unite into one family with the title as above[1]. This family further differs from all other genera of the suborder by the great difference existing between the terminal portion of the second to the fourth pair of thoracic legs and that of the fifth to the seven pair, the last three pairs having the seventh joint and the claw fused together to form a long claw, whilst the same parts in the second to the fourth pair are very short and concealed in setæ. — The genera of the family further show great agreement with one another in several respects, such as, the carapace has well-marked furrows on it, the outer ramus of the uropods has a very distinct articulation at a little distance from the tip, etc.

Of the four genera *Petalophthalmus* and *Ceratomysis* have a long, good-sized process from the fourth articulation of the maxillipeds and this process is lacking in the other two genera. *Petalophthalmus* differs greatly also from the other three genera by the mandibular palp being very much elongated and by the unusually reduced and characteristic pleopoda in the male. I mention this last character as I am acquainted with the hitherto undescribed male of *Ceratomysis,* and *Scolophthalmus* is so nearly related to *Hansenomysis* that the pleopods are probably almost the same in these two genera. Further, the outer branch of the antennules in the male is not thickened in *Petalophthalmus,* whereas it is greatly thickened in *Ceratomysis* and as in *Hansenomysis* and presumably in *Scoloph-*

[1] In the above-named paper (Fisheries, Ireland, Sci. Invest. 1904. V., [1906]) Holt & Tattersall established this family. and their diagnosis comprises the major part of the features mentioned here by me. But when I received their paper this portion of my manuscript was already translated; for that and other reasons I prefer to alter nothing in my own text, only referring the reader to their paper. I will add, that the family must, of course, bear the name of the authors, as their paper has been published years before mine, and that their diagnosis contains a correct character not pointed out by me, viz. "Inner uropods without otocyst".

thalmus. *Scolophthalmus* stands near to *Hansenomysis* and seems essentially only to differ from this in that the stalk of the antennules is considerably elongated and the carapace produced into a relatively large rostrum.

5. **Boreomysis scyphops** G. O. Sars.

1879. Boreomysis scyphops G. O. Sars, Archiv f. Math. og Naturvid., B. IV, p. 429.
! 1885. — — G. O. Sars, Norske Nordh.-Exp., Crust. I, p. 56, Pl. VI.

Occurrence. The "Ingolf" has taken this species at 13 stations.

South of Jan Mayen:	St. 113:	69° 31′ N. L.,	7° 06′ W. L.,	1309 fm.,	temp. ÷ 1·0°;	17	spec.
— - —	- 117:	69° 13′ —	8° 23′ —	1003 —	— ÷ 1·0°;	33	—
— - —	- 118:	68° 27′ —	8° 20′ —	1060 —	— ÷ 1·0°;	6	—
North of East Iceland:	St. 125:	68° 08′ —	16° 02′ —	729 —	— ÷ 0·8°;	1	—
North-East of Iceland:	- 112:	67° 57′ —	6° 44′ —	1267 —	— ÷ 1·1°;	35	—
— - —	- 119:	67° 53′ —	10° 19′ —	1010 —	— ÷ 1·0°;	5	—
— - —	- 120:	67° 29′ —	11° 32′ —	885 —	— ÷ 1·0°;	15	—
— - —	- 111:	67° 14′ —	8° 48′ —	860 —	— ÷ 0·9°;	9	—
— - —	- 110:	66° 44′ —	11° 23′ —	781 —	— ÷ 0·8°;	1	—
East of North Iceland:	- 102:	66° 23′ —	10° 26′ —	750 —	— ÷ 0·9°;	1	—
— - —	- 104:	66° 23′ —	7° 25′ —	957 —	— ÷ 1·1°;	60	—
— - —	- 105:	65° 34′ —	7° 31′ —	762 —	— ÷ 0·8°;	3	—
North of the Færoes:	- 140:	63° 29′ —	6° 57′ —	780 —	— ÷ 0·9°;	5	—

One specimen was taken by the "Thor" east of Iceland: 66° 19′ N. L., 10° 45′ W. L., 760 fm. Ohlin notes it from a place between East Greenland and Jan Mayen: 72° 42′ N. L., 14° 49′ W. L., 1053 fm. — It is easily seen that all the localities lie in the cold area north of the Færoes to the east and north-east of Iceland, also as far north as Jan Mayen and between this island and East Greenland; the depth varied between ca. 760 to 1309 fm., the bottom-temperature between ÷ 0·8° and ÷ 1·1°.

Distribution. G. O. Sars founded the species on some specimens taken in the waters N. W. of Finmark: 71° 59′ N. L., 11° 14′ E. L., 1110 fm., temp. ÷ 1·3°. Ohlin gives it from two places considerably further north, namely, 77° 52′ N. L., 3° 5′ W. L., 1455 fm., temp. ÷ 1·4° and 78° 19′ N. L., 8° 41′ E. L., 1430 fm., temp. ÷ 1·4°. In his work on the Schizopods of the "Challenger", Sars refers a number of specimens taken at 3 stations in the southern Ocean to this species; the stations lie between 46° 16′ and 53° 55′ S. L., the depth varied from 1600 to 1950 fm. and the bottom-temperature was over 0°. Being no believer in bipolarity I have always supposed that the last-named specimens belong to a different species; besides *B. scyphops* is not known from any place between the Northern Ocean and the Antarctic Sea, and the bottom-temperature is below zero at all arctic stations, above zero in the antarctic localities. In June 1907 I went to London taking with me some specimens of my *B. scyphops* for comparison with the antarctic specimens, and the result arrived at will be given presently.

Remarks. The largest of my numerous specimens, a female with marsupium, is 60 mm. from the tip of the rostrum to the end of the telson. Sars gives 70 mm., but does not state how the measurement was taken; the largest "Challenger" specimens from the Antarctic Sea is given by him

as 85 mm. measured from the end of the antennal squama to the tip of the telson — not a fortunately chosen measurement. In the British Museum (Natural History) three antarctic specimens determined by Sars are found; the specimen marked "type", a female with the marsupium scarcely fully developed, measures 54 mm. from the front end of the rostrum to the tip of the telson; the largest of the two other specimens, a female with the marsupium only half developed, measures 58 mm.; the third specimen is 49 mm. These southern specimens belong to a species very closely allied to, but not identical with, *B. scyphops,* because there is a constant and very pronounced difference in the shape of the eye-cups between the two forms. In the antarctic form, for which I propose the name *B. distinguenda* n. sp., the eye-cup (fig. 2 a) is rather oblong, the proportion between height and length (the eye-stalk omitted) being about as 17 : 25, and the protruding rim is broad, especially at the limit between the

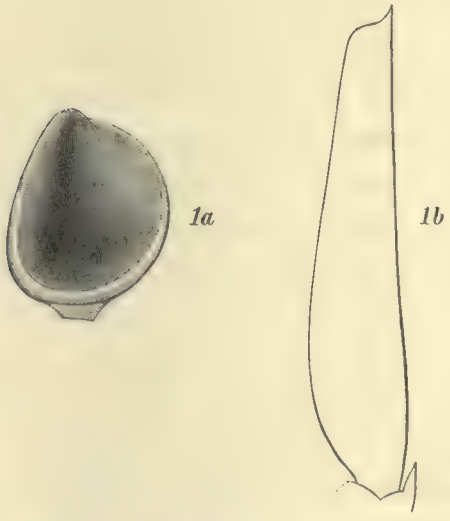


Fig. 1. *Boreomysis scyphops* G. O. Sars, 1 a. right eye, × 7; 1 b. right antennal squama, slightly more than × 6.

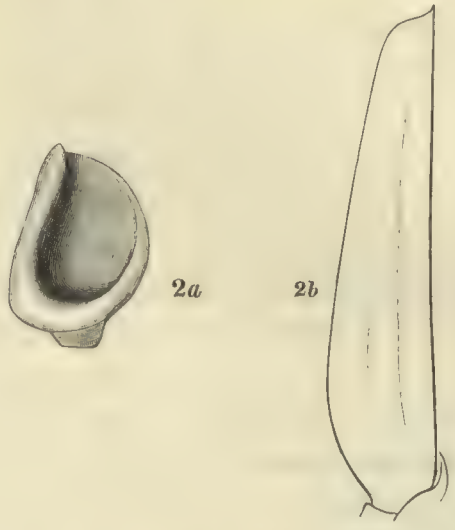


Fig. 2. *Boreomysis distinguenda* n. sp. 2 a. right eye, × 7; 2 b. right antennal squama, × $6^2/_3$.

upper and the posterior margin. In *B. scyphops* the eye-cup is relatively flatter and higher (fig. 1 a) the proportion between height and length being about as 21 : 26, the protruding rim is narrow, frequently even narrower than shown in the figure, and the distal upper lobe at the front margin is often rudimentary. A comparison between fig. 1 a and fig. 2 a will convey a good idea of the difference in outline and excavation of the eye-cups in the two species. Finally the antennal squama is slightly narrower in proportion to length in *B. scyphops* than in *B. distinguenda.*

It may be added that I have a proportionately large material of *Boreomysis* from the Arctic Seas, the Atlantic, the Indian Ocean and the Pacific; the material comprises nearly all hitherto established and several undescribed species. Some species are closely allied, and a thorough study is needed in order to avoid mistakes.

6. Boreomysis tridens G. O. Sars.

1870. Boreomysis tridens G. O. Sars, Christiania Vid. Selsk. Forhandl. for 1869, p. 153.
! 1879. — — Monogr. Norges Mysider, III, p. 17, Tab. XIV.

Occurrence. The "Ingolf" has taken this species at 5 stations.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 18 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 11 —

— — - 25; 63° 30′ — 54° 25′ — 582 — — 3·3°; 6 —

West of Iceland: St. 97: 65° 28′ N. L., 27° 39′ W. L., 450 fm., temp. 5·5°; 1 spec.

South-West of Iceland: St. 81: 61° 44′ N. L., 27° 00′ W. L., 485 fm., temp. 6·1°; 4 spec.

Further, the "Thor" has taken it twice.

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 450—500 fm.; 1 spec.

— - — 61° 08′ — 9° 28′ — 434 fm.; 15 spec.

It appears that the depth was from 362 to 582 fm. and the bottom-temperature considerably over 0°. The species seems to live near the bottom.

Distribution. Sars has taken the species at several stations in the West Fjord at Lofoten in depths from 300—400 fm. According to Sars, Norman and Nordgaard it has been taken in several Norwegian fjords from $63^{2}/_{3}°$ to $69^{2}/_{3}°$ N. L.; the lowest depth was 200 fm. Finally it was three times taken off the west coast of Ireland in 382, 454 and 500 fm. (Holt & Tattersall).

Remarks. Sars has only described the female. Amongst the considerable material in my possession are several males; one of the largest (from "Ingolf" St. 35) measures 31 mm. from tip of rostrum to end of telson. The abdominal legs in the male are essentially as in the same sex of the two following species.

7. **Boreomysis nobilis** G. O. Sars.

1879. Boreomysis nobilis G. O. Sars, Arch. Math. og Naturv., B. IV, p. 428.

! 1885. — — G. O. Sars, Norske Nordhavs-Exp., Crust., p. 54, Pl. V, figs. 22—28.

1901. — — A. Ohlin, Bih. K. Sv. Vet.-Akad. Handl., B. 27, Afd. IV, No. 8, p. 70, Fig. 3.

Occurrence. The "Ingolf" took this species at the following 6 stations.

South of Jan Mayen: St. 116: 70° 05′ N. L., 8° 26′ W. L., 371 fm., temp. ÷ 0·4°; 1 spec.

East of North Iceland: - 101: 66° 23′ — 12° 05′ — 537 — — ÷ 0·7°; 1 —

— - — - 102: 66° 23′ — 10° 26′ — 750 — — ÷ 0·9°; 1 —

North of the Færoes: - 139: 63° 36′ — 7° 30′ — 702 — — ÷ 0·6°; 1 —

— - — - 138: 63° 26′ — 7° 56′ — 471 — — ÷ 0·6°; ca. 50 spec.

— - — - 141: 63° 22′ — 6° 58′ — 679 — — ÷ 0·6°; 1 spec.

Further, it has been taken at the following localities, two of which are on Ohlin's authority, a third on Vanhöffen's.

Baffin Bay: 75° 26′ N. L., 67° 27′ W. L., 260 fm.; 2 spec. (See Malac. Groenl.).

— — : Lille Karajok Fjord, ca. 70° 20′ N. L., 100 fm. (test. Vanhöffen).

— — : 69° 15′ N. L., 52° 55′ W. L., 265 fm.; 5 spec. (See Malac. Groenl.).

— — : Jakobshavn, Traustedt; many specimens.

North-West of Iceland: 65° 57′ N. L., 27° 00′ W. L., 336 fm., temp. 0°, Wandel; 1 spec.

North of Iceland: 67° 19′ N. L., 17° 55′ W. L., 436 fm., Young-fish trawl with 800 met. wire out "Thor" 1904; 2 spec.

East Greenland: Cape Brewster: 70° 09′ N. L., 22° 02′ W. L., 250 fm., 2. Amdrup Exp.; 1 spec.
— — Off Kaiser Franz Joseph Fjord, 132 fm.; several spec. (test. Ohlin).
— — Entrance of — — 106—158 fm.; 3 spec. (test. Ohlin).

North of the Færoes: 63° 10′ N. L., 7° 31′ W. L., 532 fm., Young-fish trawl with 800 met. wire out, "Thor" 1904; 1 spec.

South-East of the Færoes: 61° 23′ N. L., 4° 21′ W. L., 505 fm., temp. ÷ 0·4°, Wandel; 1 spec.

We see that wherever the bottom-temperature was given, it was 0° or as a rule under 0°; the probability is that the 4 localities in Baffin Bay had the same temperature and for all the others it is certain that the bottom-temperature was negative. But the "Thor" has twice taken it in the young-fish trawl at a depth scarcely over 200 fm., whilst the waters at both places were more than twice this depth; whether these specimens were taken in water under or yet very near 0° cannot be determined. Future investigations must settle, however, whether the species belongs as a rule to the mesoplankton or lives near the bottom.

Distribution. Outside the area specially dealt with here, only the full-grown male on which Sars founded the species has hitherto been taken and came from 79° 59′ N. L., 5° 40′ E. L., 459 fm., temp. ÷ 1°.

Remarks. The largest specimen, an adult male from "Ingolf" Stat. 116, is 51 mm. from tip of rostrum to end of telson; the female is somewhat smaller, one of my largest specimens (from "Ingolf" Stat. 138) being only 42·5 mm. long; Ohlin gives the length of his largest female from East Greenland as 49 mm.

8. **Boreomysis arctica** Krøyer.

1861. Mysis arctica Krøyer, Naturh. Tidsskr., 3. R., B. I, p. 34, Tab. I, Fig. 5 a—f.
! 1879. Boreomysis arctica G. O. Sars, Monogr. Norg. Mysider, III, p. 10, Tab. XI—XIII.

Occurrence. The "Ingolf" has not taken this species, but it is present from other sources. Krøyer founded it on a specimen from West Greenland, but the locality is unknown; it was taken later on the same coast in Lille Karajok Fjord, ca. 70° 20′ N. L., 100 fm. by Dr. E. Vanhöffen. In 1904 the "Thor" took a number of specimens south-west of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 450—500 fm.

Distribution. The species is also known from Norway, where it was taken by G. O. Sars in Christiania Fjord, Hardanger Fjord and at Lofoten; concerning its bathymetric occurrence he writes that he had never met it "before at a depth of 200 fm. whereas in Hardanger Fjord it goes down right to 400 fm." Nordgaard notes it from West Finmark and says: "There can, however, hardly be any room for doubt that it has planktonic habits, as it has several times been taken by townetting". It has also been taken in the Skager Rak (Internat. Explor.) and west of Ireland at depths of 181 to 382 fm. (Holt & Tattersall), at the east coast of America at ca. 40° N. L., 500 fm. (S. I. Smith), lastly in the western Mediterranean near Capri (Lo Bianco).

Remarks. Czerniavsky is doubly incorrect in basing a new genus, *Arctomysis,* on this species of Krøyer and in considering it as different from Sars' form. The thoracic "tarsi" have in reality, as Sars states, only 3 joints, but there are further more or less distinct traces of other two similar "false" articulations, and it is these which Krøyer indicated as really existing articulations. The generic

character of *Arctomysis* thus falls to the ground; the species of Krøyer and Sars are identical, which has also been accepted by Sars himself and by several other observers.

9. Boreomysis microps G. O. Sars.

1883. Boreomysis microps G. O. Sars, Forh. Vid. Selsk. Christiania for 1883, No. 7, p. 35.
1885. — — G. O. Sars, Challenger Rep., Zool., Vol. XIII, p. 185, Pl. XXXIII, figs. 7—10.
! 1905. — subpellucida H. J. Hansen, Bull. Mus. Océan. Monaco, No. 30, p. 8, figs. 5—8.

Occurrence. The "Ingolf" has not found this species but it was taken by the "Thor" in 1904 at the following localities.

West of Iceland: 65° 00′ N. L., 28° 10′ W. L., 1240 m., Young-fish trawl, 1000 m. wire out; many spec.

—	-	—	65° 20′	—	27° 12½′	—	740 m.,	—	—	810 m.	—	6 spec.
—	-	—	65° 27′	—	27° 10½′	—	763 m.,	—	—	800 m.	—	2 —
South of		—	61° 34′	—	19° 05′	—	2160 m.,	—	—	1800 m.	—	7 —
—	-	—	61° 30′	—	17° 08′	—	?	—	—	1800 m.	—	many spec.
—	-	—	62° 47′	—	15° 03′	—	1950 m.,	—	—	1000 m.	—	1 spec.

South-West of the Færoes: 61° 08′ N. L., 9° 28′ W. L., 820 m., Young-fish trawl, at bottom; 1 spec.

Distribution. The species was founded on a specimen taken south of Nova Scotia: 62° 8′ N. L., 63° 39′ W. L., 1250 fm. The "Thor" has taken it 3 times in the waters west of the Hebrides with the young-fish trawl, 1500 meters wire out. It was next taken to the west of Ireland in townets from 1150 to 0 fm. (Holt & Tattersall), also at several places south of the Azores in the vertical net sunk to 1640—1770 fm., once to 820 fm. (Hansen). The species thus belongs to the mesoplankton and as a rule is scarcely met with before ca. 200 fm. down, but how deep it penetrates is naturally unknown.

Remarks. In my paper cited, I founded a new species *B. subpellucida,* as the numerous specimens I had differed considerably from Sars' descriptions and figures in some characteristics. Thus Sars has neither mentioned nor figured the very distinct process on the upper side of the eye-stalks close behind the cornea, also the proximal part of the telson is considerably narrower in relation to its length than in my specimens. Later Mr. Holt examined Sars' type preserved in the British Museum and writes (in 1906): "The fact is that in so far as the diagnosis of *B. microps* differs from that of *B. subpellucida,* the former is erroneous"; consequently he withdraws *B. subpellucida* as a synonym to *B. microps.* My own examination of Sars' type in 1906 gave the same result.

A large female with marsupium (from 65° N. L.) measures 20 mm. from tip of rostrum to end of telson; a male from 61½ N. L. is 19·5 mm. long.

10. Longithorax fuscus n. sp.

Pl. V. figs. 1 a—1 o.

Description of the Genus. As the description of the genus is founded on a single somewhat damaged female, in which the marsupium is not fully developed, this diagnosis is not quite complete[1].

[1] I had established a new genus on the present form before Dr. G. Illig's preliminary note on the "Valdivia" Mysidacea was published. Consequently I accepted the generic name *Longithorax* proposed by him for an allied species, but I did not alter anything in the descriptions of the genus or the species.

The genus is obviously different from all other hitherto known Mysidacea in having the last thoracic segment (at least in the female) very elongated; dorsally it is not much shorter than the two first abdominal segments taken together whilst ventrally it is even considerably longer than dorsally; the seventh pair of thoracic legs are inserted at its front margin. The carapace is tolerably short, deeply incised posteriorly, so that the central portion of the penultimate thoracic segment is uncovered; its lateral wings reach a little beyond the front margin of the last segment. The left mandible (fig. 1 f) has the *pars incisiva* well developed, its *lacinia mobilis* has a large and strong *cuspis* incised at the end, whilst behind this there is only a pair of weaker setæ; the *pars molaris* is slightly marked, small and weakly developed; the whole margin from the base of the *cuspis* to the posterior end of the *pars molaris* is furnished with fine hairs. The lobe of the second joint of the maxillæ (fig. 1 h) is rounded, with no protuberance, that on the third joint is cleft, the last joint of the palp unusually long, and the greater part of the under side of this joint and of the lobes are densely covered with hairs. The second joint of the maxillipeds (fig. 1 i) is long with a small but distinct lobe, the third very short with a similar lobe, the 4 following joints with inconsiderable difference in length but decreasing outwards in breadth, so that the two last are fairly narrow. The first thoracic leg (fig. 1 k) has the second joint in the form of a large plate as broad as long; the rest of the leg is slender, the sixth joint somewhat shorter than the fifth, the claw well-developed. The other thoracic legs, which increase somewhat in length from before backwards, are very slender (fig. 1 m) except as regards the second joint, which is a large and broad plate; the sixth joint is considerably longer than the fifth without oblique articulation, but its shorter distal part is separated as a distinct joint by a well-developed, vertical articulation; the seventh joint and the claw are well-developed. The exopodite on the thoracic legs (fig. 1 l) has the subbasal joint large and unusually broad, plate-like (the exopod of the maxillipeds was broken off). Antennæ and tail-fan almost as in *Meterythrops*.

It will be seen from these characteristics, that the genus must be placed in the *Erythrops*-group, showing in a number of characters considerable agreement with *Meterythrops*, but there are differences more or less in all the appendages described above in detail.

Description of the Species. As there is only the mentioned incompletely developed specimen to hand, only the carapace, eyes, antennal scale and caudal process will be described here, the other characters can be learnt from the description of the genus and the figures.

The front end of the carapace, seen from above (fig. 1 c), is triangular, with median angle a little over 90°, but the very tip is produced in a very small process which is somewhat smaller than the process on the eye-stalks. The eyes are yellowish and moderately small; seen from the side (fig. 1 b) they look downwards a little and occupy the end of the eye-stalks in a flattened arch; seen from above (fig. 1 c) they appear as a narrow band at the end of the stalk and are no broader than this; above and close behind the eye at its centre the stalk has a protruding, distally rounded process which projects forward over the eye. The squama (fig. 1 d) is moderately small, three times as long as broad; its smooth outer margin is but little more than twice as long as the breadth, whilst the setigerous terminal margin is very oblique and the distal outer corner has a short tooth. The outer ramus of the uropoda (fig. 1 n) is defective, but nevertheless much longer than the inner branch, and to judge from the serrulation the margins have undoubtedly been covered with setæ over along

almost their whole length; the sense organ in the inner ramus is moderately small, but distinct. The telson has almost the same form as in *Parerythrops abyssicola* G. O. S.; it is moderately short, reaching scarcely behind the centre of the inner ramus. The lateral margins are convex along the proximal third of their length, distinctly concave and converging considerably backwards in their distal two-thirds; the transverse terminal margin (fig. 10) is very short with 4 very long spines, the outer pair of which is shorter and a little thinner than the inner (one spine of the inner pair is lost and the other also for a smaller or greater part broken off); the distal part of the lateral margin has 5 small spines. (The hindmost pair of marsupial lamellæ are fairly small, evidently not fully developed; the lamellæ of the sixth pair of thoracic legs are very small, and there are none from the fifth pair). — Length from rostrum to end of telson 17·5 mm.

The specimen preserved in formalin was of a dark greyish brown colour when received.

Locality. The specimen described was taken by the "Thor" on July 11th 1904 at the following place:

South of Iceland: 61° 30′ N. L., 17° 08′ W. L., Young-fish trawl with 1800 meters wire out.

Distribution. According to a kind letter from W. M. Tattersall a specimen measuring 25 mm. in length was captured near the middle of June 1906 at 49° 27′ N. L., 13° 33′ W. L. in the young-fish trawl with 2800 m. of wire out; the depth of sea was 2600 m.

11. Erythrops serrata G. O. Sars.

1863. Nematopus serratus G. O. Sars, Nyt Mag. for Naturv., B. XII, p. 235.
! 1870. Erythrops serrata G. O. Sars, Mon. Norges Mysider, I, p. 27, Tab. II, Fig. 1—12.
1892. — — Norman, Ann. Mag. Nat. Hist., Ser. 6, Vol. X, p. 162, Pl. X, figs. 11.

Occurrence. This species was only taken by the "Thor", which found it at the following places.

South of Iceland: 63° 46′ N. L., 22° 56′ W. L., 70 fm.; large number of specimens.
— - — 63° 15′ — 22° 23′ — 114—172 fm.; 8 spec.
— - — 63° 18′ — 21° 30′ — 94 fm.; 15 spec.

Distribution. The "Thor" has taken it north-east of the Shetlands, 85 fm. and in the North Sea east of Scotland, 47 fm. It is noted from Shetland, 40—60 fm. (Norman), Fair Island, 60—80 fm. (Th. Scott), from several places on the east coast of Scotland (Norman, Th. Scott), from the Irish Sea (Holt & Tattersall) and west coast of Ireland, 80—293 fm. (Norman, Holt & Tattersall). Further, it has twice been taken in the Skager Rak at some distance from Jutland in 49 and 70 fm. (Metzger, Meinert). In Norway it is distributed from Christiania Fjord to West Finmark, usually in depths from 80 to 200 fm., but in 30—40 fm. in the inner parts of Christiania Fjord.

12. Erythrops abyssorum G. O. Sars.

1869. Erythrops abyssorum G. O. Sars, Nyt Mag. for Naturv., B. XVI, p. 326.
! 1870. — — G. O. Sars, Mon. Norges Mysider, I, p. 36, Tab. V, Fig. 1—12.

Occurrence. The "Ingolf" has not taken this species and it has not been brought home by any Dane from the region in question here, so that it is only included from the literature.

It was taken at West Greenland in Karajok Fjord, ca. 70° 20′ N. L., 100 fm. (Vanhöffen). At East Greenland it has been taken at 72° 28′ N. L., 21° 48′ W. L., 95 fm. (Ohlin) and somewhat further from the same coast at 72° 25′ N. L., 17° 56′ W. L., 158 fm. (Ohlin). Finally, it was taken near Jan Mayen, 195 fm. (G. O. Sars).

Distribution. The species is known from Christiania Fjord and from a number of fjords along the northern half of Norway from Lofoten to Varanger Fjord (Sars, Norman, Nordgaard); the depths varied from ca. 106 to 300 fm. Lastly, it was taken in the Kara Sea at depths from 51 to 67 fm. (Hansen).

13. **Erythrops erythrophthalma** Goës.

1864. Mysis erythrophthalma Goës, Öfv. Kgl. Sv. Vet.-Akad. Förh., Årg. 20, p. 178.
! 1870. Erythrops Goësii G. O. Sars, Mon. Norges Mysider, I, p. 24, Tab. I.
1870. — — Norman, Ann. Mag. Nat. Hist., Ser. 6, Vol. X, p. 160.

Occurrence. The "Ingolf" has not taken this species. It is mentioned from Karajok Fjord, ca. 70° 20′ N. L. on the west coast of Greenland, 26 fm. (Vanhöffen). At Jan Mayen 2 specimens were taken by the 2nd Amdrup Expedition in 50—60 fm.

Distribution. It has been taken on the east coast of Scotland in the Firth of Forth (Norman), in the North Sea at least as far south as 55° 8′ N. L. (Ehrenbaum), in the Skager Rak (Metzger), at a number of places along the whole coast of Norway from Christiania Fjord to Varanger Fjord (Lovén, G. O. Sars, Norman), at Spitzbergen (Goës, Ohlin), the White Sea and Murman Sea (Jarzynsky), Matotschkin Skar and Kara Sea (Stuxberg — it should be added, however, that I am not sure of the correctness of the last two authors' determinations). Lastly, it has also been taken in Cape Cod Bay on the east coast of North America (S. I. Smith). It is found as a rule at depths from 30 to 125 fm. Lo Bianco gives it as having been taken at some places in the Mediterranean in quite 500—600 fm., but I think the specimens have been wrongly determined.

14. **Erythrops glacialis** G. O. Sars.

1877. Erythrops glacialis G. O. Sars, Arch. Math. og Naturv., B. II, p. 342.
! 1885. — — G. O. Sars, Norske Nordhavs-Exp., Crust. I, p. 45, Pl. V, Fig. 1—4.

Occurrence. This species, which I have never seen, is taken from Ohlin, who notes it from East Greenland, off Kaiser Franz Joseph Land, 132 fm.

Distribution. The species is further only known from two places west of the middle of Norway in the cold area; the depths were 350 and 498 fm. (G. O. Sars).

15. **Meterythrops robusta** S. I. Smith.

1879. Meterythrops robusta S. I. Smith, Transact. Conn. Acad., Vol. V., p. 93, Pl. XII, figs. 1—2.
! — Parerythrops — G. O. Sars, Mon. Norges Mysider, III, p. 98, Tab. XXXIX.

Occurrence. The "Ingolf" has twice taken this species.

Davis Straits: St. 31: 66° 35′ N. L., 55° 54′ W. L., 88 fm., temp. 1·6°; 1 spec.
— — - 29: 65° 34′ — 54° 31′ — 68 — — 0·2°; 1 —
Ohlin gives it from East Greenland: 74° 35′ N. L., 18° 15′ W. L., 79 fm.

Distribution. The species, which was founded on specimens from Massachusetts Bay and Gulf of St. Lawrence in depths of 33 and 50—70 fm., has according to the literature an extensive distribution. It has been taken on the west coast of Norway at ca. $67^1/_3$ N. L. and at several places on its north coast (Bodø, Porsanger Fjord, Varanger Fjord) in 60—150 fm. (G. O. Sars). Further, it was met with near the southern end of Spitzbergen in 146 fm., temp. ÷ 1·1° (G. O. Sars); finally, in the Kara Sea, 64 fm. (Hansen). The bottom-temperature everywhere has been either negative or very low positive. — Holt and Tattersall's determination of it from the west coast of Ireland rests, according to information kindly sent by the authors, on a confusion of names with *Parerythrops obesa* G. O. Sars.

16. **Meterythrops picta** Holt & Tatt.

1905. Meterythrops picta, Holt & Tattersall, Rep. Sea and Inland Fisheries of Ireland, 1902—03, Pt. II, App. no. IV, p. 116 & 143, Pl. XIX, figs. 5—7, Pl. XXV, figs. 8—9.

Occurrence. This species was only taken by the "Thor", which found it at the 5 following localities within our area.

West of Iceland: 65° 08′ N. L., 28° 10′ W. L., 1240 m., Young-fish trawl, 800 m. wire out; 1 spec.
— - — 65° 10′ — 27° $12^1/_2$′ — ? m., — — 740 m. — 1 —
South - — 61° 34′ — 19° 05′ — 2160 m., — — 1800 m. — 1 —
— - — 61° 30′ — 17° 08′ — ? m., — — 1800 m. — 4 —
South-West of the Færoes: 60° 00′ N. L., 10° 35′ W. L., 1015 m., Young-fish trawl, 1000 m. wire out; 1 spec.

Distribution. The "Thor" has also taken this species twice west of the Hebrides in the young-fish trawl with 1500 meters wire out. It was founded on a single specimen taken west of Ireland in a net sunk to the bottom, 382 fm. — All the 7 localities of the "Thor" show, that the species belongs to the mesoplankton, the young-fish trawl fishing in 180 to 450 fm.

Remarks. This beautiful species is extremely easily recognised. An adult male measures 12·4 mm.

17. **Parerythrops obesa** G. O. Sars.

1864. Nematopus obesus G. O. Sars, Nyt Mag. for Naturv., B. XV, p. 258.
! 1870. Parerythrops obesa G. O. Sars, Mon. Norges Mysider, I, p. 41, Tab. III.

Occurrence. The species has only once been taken by the "Thor" at the following locality.
South of Iceland: 63° 5′ N. L., 20° 7′ W. L., 295 fm.; several specimens.

Distribution. The species occurs along the Norwegian coast from Christiania Fjord to West Finmark, 50—300 fm. (G. O. Sars; Nordgaard). Further, it was taken west and south-west of Ireland (Holt & Tattersall, who discuss its bathymetric occurrence in 1905). Lo Bianco gives it from some places in the Mediterranean in depths of quite 500 to over 600 fm., but this determination until further information is forthcoming must be regarded as uncertain.

18. Parerythrops spectabilis G. O. Sars.

1877. Parerythrops spectabilis G. O. Sars, Arch. for Math. og Naturv., B. II, p. 343.

! 1885. — — G. O. Sars, Norske Nordhavs-Exp., Crust. I, p. 47, Pl. V, Fig. 5—12.

Occurrence. The "Ingolf" has once taken this species.

North-West of the Færoes: St. 138: 63° 26′ N. L., 7° 56′ W. L., 471 fm., temp. ÷ 0·6°; 1 spec.

It is given from West Greenland: Karajok Fjord, ca. 70° 20′ N. L. (Vanhöffen). It was taken by the North-Atlantic Expedition south-west of Jan Mayen: 70° 41′ N. L., 10° 10′ W. L., 263 fm., temp. ÷ 0·3°. Ohlin gives it from East Greenland, north of Kaiser Franz Joseph Fjord, 132 fm.; and from 74° 52′ N. L., 17° 16′ W. L., 185 fm.

Distribution. The species is otherwise known only from a place in the cold area, namely, off Norway at 63° 10′ N. L., 417 fm., temp. ÷ 1·0° (G. O. Sars). It has thus been taken at only 6 localities in all, probably all with negative bottom-temperature.

19. Amblyops abbreviata M. Sars.

1869. Pseudomma abbreviatum M. Sars, Forh. Vid. Selsk. Christiania f. 1868, p. 262 (without description).

1869. Amblyopsis abbreviata G. O. Sars, Nyt Mag. for Naturv., B. XVI, p. 328.

! 1872. Amblyops abbreviata G. O. Sars, Mon. Norges Mysider, II, p. 5, Tab. VI.

Occurrence. The "Ingolf" has taken this species once.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 3 spec.

According to the Malac. Groenl. it was taken by the "Fylla" in the Davis Straits: 65° 35′ N. L., 54° 50′ W. L., 80 fm. It was found by the "Thor" south of Iceland: 63° 46′ N. L., 22° 56′ W. L., 79 fm.; 2 spec.

Distribution. Otherwise it is known from Norway, where it has been taken at a number of localities from Christiania Fjord to Vardø in depths from 100 to 300 fm. (G. O. Sars). Besides it has been taken three times west of Ireland, in depths from 337 to 454 fm. (Holt & Tattersall).

20. Amblyops n. sp. = A. Crozetii Ohlin not Sars.

Occurrence. According to Ohlin it was taken between East Greenland and Jan Mayen: 72° 42′ N. L., 14° 49′ W. L., 1058 fm., 5 specimens.

Remarks. Ohlin (l. c., p. 74) does not describe the 5 specimens mentioned, which he refers to the *A. Crozetii* G. O. S. taken at 46° 16′ N. L. in the Southern Ocean; he says he is only able to find "very slight differences in a few respects" between Sars' description and figures of this southern species and his own arctic specimens. As I believe, at any rate until further information is forthcoming, that the form taken off East Greenland must be specifically distinct from *A. Crozetii,* I have preferred to give the arctic form as a new species without however giving it any name.

21. Paramblyops rostrata Holt & Tatt.

1905. Paramblyops rostrata Holt & Tattersall, Rep. Sea and Inland Fisheries of Ireland, 1902—1903, Pt. II, App. no. IV, p. 125 and 144, Pl. XXI.

Occurrence. Hitherto this species has only once been taken by the "Thor".

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 450—500 fm.; 4 spec.

Distribution. Hitherto only known from localities west of Ireland where it was taken several times in depths from 180 to 382 fm. (Holt & Tattersall).

22. **Pseudomma roseum** G. O. Sars.

Pl. V, fig. 2 a—2 b.

1870. Pseudomma roseum G. O. Sars, Forh. Vid. Selsk. Christiania f. Aar 1869, p. 154.

! 1870. — — G. O. Sars, Mon. Norges Mysider, I, p. 54, Tab. IV.

Occurrence. The "Ingolf" has twice taken this species.

Davis Straits: St. 35: 65° 16′ N. L., 55° 05′ W. L., 362 fm., temp. 3·6°; 1 spec.

— — - 27: 64° 54′ — 55° 10′ — 393 — — 3·8°; 4 —

It has also been obtained at other localities; at the first named it was taken by Admiral Wandel, at the others by the "Thor".

Davis Straits: 66° 49′ N. L., 56° 28′ W. L., 235 fm., temp. 4·4°; 1 spec.

South of Iceland: 63° 05′ N. L., 20° 07′ W. L., 300 fm.; 5 spec.

South-West of the Færoes: 61° 15′ N. L., 9° 35′ W. L., 450—500 fm.; 9 spec.

— - — 61° 08′ — 9° 28′ — 434 fm.; 3 spec.

Distribution. As *P. frigidum* n. sp. has to be separated as a distinct species from *P. roseum,* the distribution offers some difficulties, as Sars has mixed the two species and it is not always possible to determine with certainty to which of them the specimens from certain of the localities mentioned in the literature have belonged. It is certainly this species, which Sars has had before him from localities on southern and western Norway up to West Finmark, 100—450 fm. The specimens mentioned by S. I. Smith as taken at New England, at ca. 40° N. L., 500 fm. and in the Gulf of Maine, 105 fm., probably belong to this species likewise, and it is not unlikely that his specimens taken in the Gulf of St. Lawrence in 110 and 210 fm. also belong here. Specimens given from distinctly arctic localities all belong probably to *P. frigidum* and are mentioned under that species. Holt & Tattersall's statement in 1905 of the occurrence of *P. roseum* in localities west of Ireland has arisen from an error which the authors corrected in their subsequent paper published in 1906.

23. **Pseudomma frigidum** n. sp.

Pl. V, fig. 3 a—3 b.

Description. Stands extremely near to *P. roseum,* but is much larger, the adult female of the latter species being only ca. 15 mm. long whilst two females of *P. frigidum* (from "Ingolf" St. 138) measure 25·2 mm. from the anterior edge of the eye-plate to the end of the telson; the single male I have is 23 mm. But the species may be even larger, as Ohlin gives 28 mm. for the female, 24 mm. for the male. The eye-plate (fig. 3 a) is almost as in *P. roseum,* but the serrulation is a little less developed. The antennal squama (fig. 3 b) offers a prominent characteristic: the smooth part of the

outer edge to the tip of the marginal spine is but little less than twice as long as the oblique setigerous distal edge measured to the base of the marginal spine, whereas in *P. roseum* the smooth outer edge is only $^3/_2$ times longer than the setigerous distal edge. The telson almost as in *P. roseum*.

Occurrence. The "Ingolf" has once taken the species.

North-West of the Færoes: St. 138: 63° 26′ N. L., 7° 56′ W. L., 471 fm., temp. ÷ 0·6°; 8 specimens. The Ryder expedition has also taken a single specimen, a male, south of Jan Mayen: 70° 32′ N. L., 8° 10′ W. L., 470 fm. Ohlin gives *P. roseum* from 3 localities at East Greenland, namely, in Franz Joseph Fjord, off the same fjord, and at 74° 30′ N. L., 18° 40′ W. L., depths from 42—53 fm. and down to 132 fm.; as the localities are distinctly arctic and his specimens, as mentioned above, agree with *P. frigidum* in size, it is undoubtedly this species and not *P. roseum* which he has had in his hands.

Distribution. G. O. Sars in the Norwegian North-Atlantic Expedition mentions his having had unusually large specimens of *P. roseum* from two localities in the cold area: the one of these at 63° 10′ N. L. off Norway, depth 417 fm., temp. ÷ 1·0°, the other is given as from "the tract of Ocean south-west of Jan Mayen (Stat. 251)" — but some error must have crept in here as Stat. 251 lies off Lofoten (depth 634 fm., temp. ÷ 1·3°). The specimens from these two localities have certainly been *P. frigidum*. Further, I am inclined to believe that Stuxberg's determination, Matotschkin Shar, 60—70 fm., should also be relegated to this species.

24. **Pseudomma affine** G. O. Sars.

1870. Pseudomma affine G. O. Sars, Forh. Vid. Selsk., Christiania, Aar 1869, p. 156.
! 1872. — — G. O. Sars, Mon. Norges Mysider, II, p. 57, Tab. V, Fig. 13—22.
! 1906. — — Holt & Tattersall, Fisheries, Ireland, Sci. Invest., 1904, V, p. 27, Pl. III, figs. 1—6.

Occurrence. The species has only been taken by the "Thor", at the following locality.

South-West of the Færoes: 61° 08′ N. L., 9° 28′ W. L., 434 fm.; many specimens.

Distribution. It has been taken in the north of western Norway up to Lofoten, 100—200 fm. (G. O. Sars). Has further been trawled by the "Thor" in the North Sea at 58° 32′ N. L., 4° 18′ E. L., 148 fm., and several times west of Ireland in depths from 120 to 500 fm. (Holt & Tattersall). Lo Bianco states that he has seen specimens taken at 3 places in depths of over 500 and 600 fm. in the Mediterranean, but I greatly doubt the correctness of his determination.

Remarks. As shown by Sars, the eye-plate in the females is produced forwards in a cleft process, by means of which they are easily known from *P. roseum*, but on the other hand the extent of the marginal serrulation does not agree with Sars' description, as in my specimens the posterior part of the lateral margin is smooth, so that the serrulated part is not much longer than in *P. roseum*, whereas according to Sars the serrulation in *P. affine* reaches to behind the lateral corner. The telson in my specimens shows an intermediate stage between Sars' figures of *P. roseum* and *P. affine*, its posterior margin being less broad than in the latter and with 3, at most 4, pairs of spines. Nevertheless I consider that my specimens, especially on account of the form of the eye-plate at the centre of its anterior margin, must be referred to *P. affine* G. O. S.

25. **Pseudomma truncatum** S. I. Smith.

1879. Pseudomma truncatum S. I. Smith, Trans. Conn. Acad. Vol. V, p. 99, Pl. XII, figs. 3, 4.
! 1879. — — G. O. Sars, Mon. Norges Mysider, III, p. 102, Pl. XL.

Occurrence. Was once taken by the "Ingolf".

North of Iceland: St. 128: 66° 50′ N. L., 20° 02′ W. L., 194 fm., temp. 0·6°; 1 spec.

It is also noted from Karajok Fjord, West Greenland, at 70° 20′ N. L., 102 fm. (Vanhöffen).

Distribution. The species was founded on specimens taken in the Gulf of St. Lawrence in depths from 45 to 70 fm.; Sars gives it from Varanger Fjord, 150 fm., from a point south of Spitzbergen, 267 fm., temp. ÷ 1·1° and from another west of Spitzbergen, 125 fm., temp. 1·9°. It is further known from the Kara Sea, 51 fm. (Hansen), and is noted from Behring Sea (Richters), but though the last-named locality is not improbable, the correctness ought to be confirmed.

26. **Pseudomma Théeli** Ohlin.

1901. Pseudomma Théeli A. Ohlin, Bih. Kgl. Sv. Vet.-Akad. Handl., B. 27, Afd. IV, no. 8, p. 78, Fig. 5.

Occurrence. This species is as yet only known from the two type-specimens taken at "East Greenland, Franz Joseph Fjord, entrance of Musk-ox Fjord, depth 220 m." (116 fm.).

27. **Pseudomma parvum** Vanhöffen.

Pl. V, fig. 4 a—4 h.

1897. Pseudomma parvum E. Vanhöffen, Drygalski's Grönland-Expedition, p. 199.
! 1907. — — Zool. Jahrb., Abth. für Systematik, B. XXV, p. 508, Taf. 20, Fig. 1—3.

Description. This description[1] is founded on 2 specimens, a fine, egg-carrying female and a somewhat mutilated male, both most kindly placed at my disposal by the founder of the species.

Anterior margin of eye-plate taken as a whole (fig. 4 a) is somewhat strongly convex, but in the centre there is a fairly slight inbending, angular at its base though a median narrow cleft is absent; further, the margin is somewhat concave for a considerable distance about half way between the median line and the lateral corner, whilst its lateral portion is very convex. The upper surface and anterior margin of the eye-plate under a magnification of quite 100 times show a number of small, conical protuberances and a quantity of fine hairs of the same length, further a somewhat larger tubercle directed forwards and upwards near the anterior margin a little distance from the median line. The front margin of the carapace under the lateral corner of the eye-plate is regularly and moderately strongly serrulated for a part of its length. — The antennal squama (fig. 4 b) is almost as in *P. Théeli,* a little over five times as long as broad; almost two-thirds of the terminal margin is somewhat convex whilst the remaining third is the base for the process at the outer margin, which is specially large, both broad and thick at the root and extending far out over the distal edge; the setæ along the inner margin are extremely long, the longest indeed being but little shorter than the

[1] My description and drawings had been made a long time before Dr. Vanhöffen published his more detailed account of this species.

squama. The last joint of the mandibular palp (fig. 4 c) is comparatively much broader and somewhat shorter than in *P. roseum,* and distinctly triangular. In the maxillipeds (fig. 4 d) the 5th to 7th joints especially are somewhat broader than in *P. roseum,* the 5th besides obviously shorter than in this species. The 2nd joint of the first pair of legs has on its underside distally a distinct, thick, rounded protuberance and proximally a smaller one; the whole leg (fig. 4 e) is somewhat thicker and shorter than in *P. roseum,* the 5th and 6th joints especially being shorter; the proximal part of the exopod is very broad. In the female the 4th and 5th pair of abdominal appendages (fig. 4 f) especially are obviously longer than in *P. roseum,* the 4th pair being a little longer than the 5th segment, the 5th pair even a little longer than the long 6th segment. The inner branch of the uropods (fig. 4 g) reaches quite as far backwards as the outer branch, whereas in *P. roseum* it is considerably shorter than the latter. The telson (fig. 4 h) is somewhat longer and narrower than in *P. roseum;* its end in my single specimen with the tail-fan well preserved is broad and somewhat flatly rounded with 3 pairs of long spines of equal length, whilst ciliated setæ could not be detected; on each lateral margin are 5 to 6 spines. — Length of an ovigerous female 13 mm.

Remarks. This species is widely separated by the structural characters mentioned from all the foregoing except *P. Théeli* to which it stands near especially in the form of the squama, the last joint of the mandibular palps and the comparatively plump maxillipeds and first pair of legs. But *P. Théeli* according to Ohlin is 20 mm. long, thus much larger, its eye-plate shows quite a different form and its telson is somewhat longer in relation to its breadth.

Occurrence. West Greenland: Karajok Fjord, ca. 70° 20′ N. L., 100 fm., Vanhöffen.

28. **Mysidopsis didelphys** Norm.

1863. Mysidopsis didelphys Norman, Trans. Tyneside Natur. Field Club, Vol. V, p. 270, Pl. XII, figs. 9—11 (teste Norman).

! 1872. Mysidopsis didelphys G. O. Sars, Mon. Norges Mysider, II, p. 20, Tab. VII.

Occurrence. Only twice taken by the "Thor".

South of Iceland: 63° 46′ N. L., 22° 56′ W. L., 80 fm.; ca. 15 spec.

— · — 63° 18′ — 21° 30′ — 94 —; 2 spec.

Distribution. It is known from the Shetlands, both coasts of Scotland and north-east England, 40—70 fm. (Norman, Th. Scott), west of Ireland in depths from a little over 50 to 199 fm. (Holt & Tattersall), also Skager Rak N. E. from the north point of Jutland, 110 fm. (Meinert) and Norway from Christiania Fjord to Lofoten, 30—150 fm. (G. O. Sars).

29. **Pseudomysis abyssi** G. O. Sars.

Pl. V, fig. 5 a—5 d.

1879. Pseudomysis abyssi G. O. Sars, Arch. Math. og Naturv., IV, p. 430.

! 1885. — — G. O. Sars, Norske Nordhavs-Exp., Crust. I, p. 50, Pl. V, Fig. 13—21, Pl. XX, Fig. 18—20.

Occurrence. Taken three times by the "Ingolf".

South of Jan Mayen: St. 113: 69° 31′ N. L., 7° 06′ W. L., 1309 fm., temp. ÷ 1·0°; 3 spec.

— - — - 117: 69° 13′ — 8° 23′ — 1003 — — ÷ 1·0°; 1 —

North-East of Iceland: - 110: 66° 44′ — 11° 33′ — 781 — — ÷ 0·8°; 1 —

Distribution. Sars had 2 specimens, both taken between North Cape and Jan Mayen, the one at 72° N. L., in 1110 fm., temp. ÷ 1·3°, the other in the stomach of *Rhodichthys regina* from 72° 36′ N. L., 1280 fm., temp. ÷ 1·4°. Ohlin had a fragment from 78° 19′ N. L., 8° 41′ E. L., 1428 fm., temp. ÷ 1·4°. The species thus dwells in considerable depths with low to very low temperatures, always negative, in the Northern Ocean between Iceland, East Greenland, Spitzbergen and Norway.

Remarks. A small addition to Sars' (and Ohlin's supplementary) description may be given here. My best specimens are from St. 117; the one of these is a female with marsupium measuring ca. 45 mm. from the tip of the rostrum to the end of the telson, whilst a male is 42 mm. long. The eye-stalks differ a little in form; the most distal part is sometimes more developed than Sars gives it, in form like a conical process pointing forwards (fig. 5 a). — The female has 3 pairs of marsupial lamellæ, the first pair small. — The pleopods of the male resemble in most features those in *Mysideis insignis* G. O. S.; on the first pair (fig. 5 b) the outer branch is but little longer than that of the fourth pair, whilst the inner branch (fig. 5 c) is very short (yet by comparison considerably larger than in *M. insignis*), oblong-eggshaped, distally broadly rounded, with the usual basal side-process on the outer margin. The IInd—IVth pairs are almost the same both in form and length of rami; in the IVth (fig. 5 d) the exopod is but little longer than the endopod, but the penultimate joint half as long again as the antepenultimate, and there are no thick terminal setæ with hairs covering the one side as in *M. insignis*.

30. Mysideis insignis G. O. Sars.

1864. Mysis insignis G. O. Sars, Nyt Mag. for Naturv., B. XIII, p. 245.

! 1879. Mysideis insignis G. O. Sars, Mon. Norges Mysider, III, p. 2, Tab. IX—X.

Occurrence. Only once taken by the "Thor".

South of Iceland: 63° 15′ N. L., 22° 23′ W. L., 114–172 fm.; ca. 10 spec.

Distribution. The species has been taken in Christiania Fjord and along the west coast of Norway at least to Malangen, ca. 69$^2/_3$° N. L., in 50 to 300 fm. (G. O. Sars, Nordgaard). It was next taken west and south-west of Ireland in depths from a little over 50 to 372 fm. (Norman, Holt & Tattersall).

31. Stilomysis grandis G. O. Sars.

1864. Mysis grandis A. Goës, Öfv. Kgl. Sv. Vet. Akad. Förh., Årg. 20, 1863, p. 176.

! 1879. Mysideis grandis G. O. Sars, Mon. Norges Mysider, III, p. 106, Tab. XLI—XLII.

Occurrence. Once taken by the "Ingolf".

Baffin Bay: St. 33: 67° 57′ N. L., 55° 30′ W. L., 35 fm., temp. 0·8°; 4 spec.

In Malac. Groenl. it is noted from an adjacent place in Baffin Bay: 67° 4′ N. L., 54° 28′ W. L., 32 fm., 2 specimens; later, some specimens were taken at Jakobshavn, 69° 13′ N. L., by Traustedt.

According to Ohlin it has twice been taken at East Greenland, namely, in Franz Joseph Fjord in 55 fm. and at 74° 35′ N. L., 18° 15′ W. L., 79 fm.

Distribution. It is known from West and East Finmark, 30—100 fm. (G. O. Sars). At Spitzbergen it has been taken not a few times (Goës, Ohlin, Zimmer) up to 80° N. L.; in a single case the depth was only 5—16 fm. Lastly it was found at 70° 51′ N. L., 53° E. L., 29 fm. (Stebbing). Richters gives it from the Bering Sea, 70 fm., but this determination, in itself not improbable, needs confirmation.

32. **Mysis (Praunus) inermis** Rathke.

1843. Mysis inermis Rathke, Nova Acta Acad. Cæs. Leop.-Car., Tab. XX, p. 20.
1861. — cornuta Krøyer, Nat. Tidsskr., 3. Række, B. I, p. 26, Tab. I, Fig. 3 a—g.
! 1879. — inermis G. O. Sars, Mon. Norges Mysider, III, p. 54, Tab. XXVII.

Occurrence. The "Ingolf" has not taken this species. But to judge from the material in the Copenhagen Museum it must be common at the Færoes, as it has been taken a number of times at various localities: Thorshavn, Kvalbø, Kolle Fjord, Tveraa, Sandvaag, Trangisvaag. The depths were quite small, greatest 9½ fm.

Distribution. The species occurs at Shetland, on both coasts of Scotland, north-east England, Plymouth and Guernsey (Norman); further, in the Zuidersee (Metzger), south-east of Yarmouth (Metzger) and at Heligoland (several observers). It is found at Denmark (Meinert), west coast of Sweden (Goës) and deep in the Baltic (Lindstrøm), further it has been taken at Bohuslän (Goës) and is common along the whole coast of Norway (G. O. Sars). Lastly, it has been taken in the White Sea and in the Murman Sea (Czerniavsky and Jarzynsky), a single specimen is noted from Spitzbergen (Krøyer) It is distinctly a shallow water species, usually in depths from 2 out to 10 fathoms.

33. **Mysis (Schistomysis) ornata** G. O. Sars.

1864. Mysis ornata G. O. Sars, Nyt Mag. for Naturv., B. XIII, p. 264.
! 1879. — — G. O. Sars, Mon. Norges Mysider, III, p. 62, Tab. XXIX.

Occurrence. The species was taken 6 times by the "Thor" off the south coast of Iceland between 22° 56′ and 16° 32′ W. L. in depths from ca. 25 to 80 fathoms.

Distribution. The species is known at Shetland and from several places along the east coast of Great Britain (Norman, Metzger), at Liverpool (Walker), south-west coast of Ireland (Norman), Channel (Internat. Explor.), Holland (Hoek), mouth of the Seine (de Kerville, teste Norman) and Concarneau on the south-west coast of Brittany (Bonnier). It has been taken at two places in the Baltic about the Danish Islands as also round the Kattegat in depths from 4 to 17½ fm. (Meinert), further repeatedly in the Skager Rak and various parts of the North Sea (several observers). At Norway it goes from Christiania Fjord to Lofoten in depths from 15—20 fm. down to at least 50 fm. (G. O. Sars).

34. **Mysis oculata** O. Fabr.

1780 (?). Cancer oculatus O. Fabricius, Fauna Groenl., p. 245.
1781 (?). — — O. Fabricius, Kgl. D. Vid. Selsk. Skrifter, Ny Samling, I, p. 565, Fig. 2, A and B.

1846. Mysis oculata H. Krøyer, Voy. en Scand., Crust. Pl. VIII, figs. 2, a—r and figs. 3, a—f.
1861. — — H. Krøyer, Nat. Tidsskr., 3. Række, B. I, p. 13.
! 1879. — — G. O. Sars, Mon. Norges Mysider, III, p. 69, Tab. XXXI.

Occurrence. The "Ingolf" has not taken this species.

It is given from 79° 38′ N. L. at Grinnell Land (Miers). According to Ortmann (1901), Ohlin (1895) and myself in Malac. Groenl. the species is common through Smith Sound, on both sides of Baffin Bay and along the east coast of Davis Straits; the numerous depths noted all lie between 2—3 fm. to 30—40 fm., but it is doubtful as yet whether depths a little greater are correct, as the specimens, which certainly at times live pelagically, might be taken in the apparatus on hauling in. At East Greenland it is likewise common; it was repeatedly taken at Tasiusak and a little north of this to 66° 15′ N. L. (1st Amdrup Exped.), further in enormous numbers in the eel-seine in 7—0 fm. at 70° 50′ N. L., 22° 31′ W. L., and two specimens at Sabine Islands: 74½° N. L., 18⅔° W. L. (2nd Amdrup Exped.); Buchholz had already noted it from the last-named locality and from Cape Philip Brooke (74° 56′ N. L., 17° 36′ W. L.); Ohlin gives it from 4 East Greenland localities, lying respectively in Scoresby Sound and north of Kaiser Franz Joseph Fjord. It was also taken by the 2nd Amdrup Expedition at Jan Mayen, where it had been observed previously in quite enormous quantities (G. O. Sars). Further, according to material in the Copenhagen Museum, it has often been taken at Iceland, both on its west coast (Reykjavik and Faxe Fjord), north coast (Ønundar Fjord, Øfjord) and east coast (Seydis Fjord and Røde Fjord), but has not been met with on its south coast and seems to be absent at the Færoes.

Distribution. The species is arctic. It is known from West Finmark (Sp. Schneider), East Finmark (G. O. Sars), Murman Sea, Sea of Kara and Siberian Arctic Ocean to the east as far as 85° E. L. (Stuxberg); further, it is common round Spitzbergen (several observers). According to Packard it is "abundant along the whole coast" of Labrador, but Stimpson's statement of its occurrence on the north-east coast of the States is extremely doubtful according to Smith. Lastly, it is given from the Bering Sea (Richters). It is usually found in 2 to 20 fm. and there are several notes of its occurrence in 30—70 fm., but these last I think are not so reliable, as I believe it possible as already mentioned that the specimens on the occasions were taken in the apparatus on hauling in. — The variety *M. relicta* found in brackish and fresh water is omitted here.

Remarks. The largest female (from East Greenland at 70° 50′ N. L.) is 29·7 mm. long from front end of rostrum to tip of telson; a large male is 26·4 mm. long. Ohlin reports that his largest specimen from Smith Sound was 33 mm. long.

35. Mysis mixta Lilljeb.

1853. Mysis mixta W. Lilljeborg, Öfv. Kgl. Sv. Vet. Akad. Förhandl. 9. Årg. 1852, p. 6.
1861. — latitans Krøyer, Nat. Tidsskr., 3. Række, B. I, p. 30, Tab. I, Fig. 4 a—b.
! 1879. — mixta G. O. Sars, Mon. Norges Mysider, III, p. 76, Tab. XXXIII.

Occurrence. The "Ingolf" has not taken this species.

At West Greenland it has sometimes been taken, thus in Disco Bay, at Godhavn, Jakobshavn,

Christianshaab and Holsteensborg, that is from ca. 69$^1/_3$ N. L. to 66° 56′ N. L., and the depths varied from 5 to 15 fm. At East Greenland it was twice taken by the 2nd Amdrup Expedition, namely, along with the previous species in the eel-seine in 7—0 fm. at 70° 30′ N. L., 22° 31′ W. L., and at 72° 28′ N. L., 25° 23′ W. L., 3—14 fm.; Ohlin mentions some specimens from the same coast north of Kaiser Franz Joseph Fjord at similar depths. According to material in our Museum it has been taken very frequently at Iceland, namely, on the west coast (Skagi, Reykjavik at the latter locality according to G. O. Sars), north-west coast (Patrik Fjord and Ønundar Fjord), north coast (Skálfandi) and east coast (Seydis Fjord, Røde Fjord and Beru Fjord); the depths were usually from 10 to 35 fm., sometimes possibly less, whilst 74 fm. is once noted. On the other hand, it is not known from the south coast of Iceland nor from the Færoes.

Distribution. The species has often been taken on the east coast of North America from Fundy Bay to Massachusetts Bay, 20 to 90 fm. (Smith). In Europe its distribution is characteristic: it is given from the Baltic, penetrating right up into the Gulfs of Bothnia and Finland (Internat. Explor.), has been several times taken near the Danish Islands (Meinert), has been found at Kullen on the west coast of Sweden (Lilljeborg), in the inner parts of Christiania Fjord and in Trondhjem Fjord, is also common from Lofoten northwards along the coast and at East Finmark (G. O. Sars). Lastly, it is given from the White Sea and Murman Sea (Czerniavsky and Jarzynsky). At Denmark it has been taken in 6 fm., whilst Sars gives 20—100 fm. for its occurrence at Norway.

Remarks. The largest specimens are, as was to be expected, from East Greenland. The largest specimen, a female with half-developed marsupium, measures 31·2 mm. from tip of rostrum to end of telson; the males are not nearly so large and one of the largest from the same locality (70° 50 N. L.) is only 22·6 mm. long.

ADDITIONS AND CORRECTIONS.

Inachus leptochirus Leach is to be added to the list of Decapoda from the region defined for investigation, as A. Appellöf states (Die Dekapoden Crustaceen, 1906, p. 187) that the "Michael Sars" took this species "auf dem Færö-Plateau (Tiefe 125 Met.)"; he adds that he is unable to decide whether some very small specimens of the genus *Inachus* from the same locality belong to *I. dorynchus* Leach.

In the lists of synonymy the following dates of publication are to be corrected. In the lists on p. 16, p. 17 and p. 25 Bell, Brit. Crust. is given as published in 1844 instead of 1853. In the lists belonging to *Galacantha rostrata* (p. 35) and *Munidopsis curvirostra* (p. 36) Smith's paper is stated as published in 1884 instead of 1882; in the list belonging to *Munidopsis similis* (p. 38) 1887 is given instead of 1886.

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. *Geryon affinis* A. Milne-Edwards & Bouvier.

Fig. 1 a. Carapace of the male; natural size.
— 1 b. Carapace of the ovigerous female; natural size.

Fig. 2. *Cymonomus Normani* Lankester.

Fig. 2 3. Body of the female from the "Ingolf"; × scarcely 5.
— 2 b. Outline of the front part of the carapace with the eye-stalks of the "Ingolf" specimen; × $^{25}/_{2}$.
— 2 c. Outline of the front part of the carapace with the eye-stalks of a female from the "Thor"; × $^{25}/_{2}$.
— 2 d. Outline of the front part of the carapace with the eye-stalks of a male from the "Thor"; × $^{25}/_{2}$.
— 2 e. Left maxilliped of the "Ingolf" specimen, from below; × $^{22}/_{3}$.
— 2 f. Right first leg of the same specimen; × $^{22}/_{3}$.
— 2 g. Right fourth leg of the same specimen; × $^{22}/_{3}$.
— 2 h. Right fifth leg of the same specimen; × $^{22}/_{3}$.
— 2 i. Distal part of right fifth leg; × 25.

Fig. 3. *Paralomis spectabilis* n. sp.

Fig. 3 a. Large male, from Stat. 96; natural size.
— 3 b. Front right part with the peduncle of the antenna of the large male shown in fig. 3 a, from above; × scarcely 3.
— 3 c. Left and right antennal squamæ of the small male (from stat. 92), both from above and a little obliquely from the outer side; × $^{11}/_{2}$.
— 3 d. Left and right antennal squamæ of a large female (from stat. 96), both vertically from above; × a little more than $^{5}/_{2}$.

Plate II.

Fig. 1. *Paralomis spectabilis* n. sp. (continued).

Fig. 1 a. Abdomen of the male from Stat. 96; × $^{10}/_{9}$.
— 1 b. Abdomen of the female from Stat. 96; natural size.

Fig. 2. *Paralomis Bouvieri* n. sp.

Fig. 2 a. The female; natural size.
— 2 b. Front end of cephalothorax and eyes of the male; × 5.
— 2 c. Front right angle of cephalothorax with the proximal part of the antenna of the female, from above; × 5.
— 2 d. Front right angle of cephalothorax with the proximal part of the antenna of the male, from above; × 5.
— 2 e. Front left angle of cephalothorax with the proximal part of the antenna of the male, from above; × 5.
— 2 f. Abdomen of the male; × $^{5}/_{2}$.
— 2 g. Abdomen of the female; × $^{3}/_{2}$.

Fig. 3. *Munida bamffica* Pennant.

Fig. 3 a. Thoracic sternum with the basal joint of the appendages of the right side of a male from 61° 9′ N. L., 7° 34′ W. L., 180 fm.; × 3.

Fig. 4. *Munida tenuimana* G. O. Sars.

Fig. 4 a. Thoracic sternum with the basal joint of the appendages of the right side of a large male from the "Ingolf" Stat. 9; × 3.

Plate III.

Fig. 1. *Munida tenuimana* G. O. Sars (continued).

Fig. 1 a. Body of a large male from the "Ingolf" Stat. 9; × 2.

Fig. 2. *Munidopsis curvirostra* Whiteaves (on the plate *curvirostris*).

Fig. 2 a. Largest male from the "Ingolf" Stat. 9; × 2.
— 2 b. Cephalothorax of the same male, from the right side; × nearly 2.
— 2 c. Cephalothorax of a female from the "Ingolf" Stat. 35; × 9/5.
— 2 d. Cephalothorax of another female from the same Station; × 9/5.
— 2 e. Cephalothorax of a male from the "Ingolf" Stat. 28; × 9/5.

Fig. 3. *Munidopsis Antonii* A. Milne-Edw. & Bouv.

Fig. 3 a. Male; × 3/2.
— 3 b. Cephalothorax of the same specimen from the side; × 3/2.

Fig. 4. *Munidopsis similis* S. I. Smith.

Fig. 4 a. Ovigerous female; natural size.
— 4 b. Cephalothorax of the same female, from the right side; natural size.

Fig. 5. *Spongicoloides profundus* n. gen., n. sp.

Fig. 5 a. Front part of an ovigerous female, from the left side; × 11/2.
— 5 b. Rostrum of the same specimen; × 11.
— 5 c. Rostrum of another ovigerous female; × 11.
— 5 d. Rostrum of a scarcely full-grown specimen; × 11.
— 5 e. Left antennula (the flagella mutilated), from below; × 19/2.
— 5 f. Left antenna (most of the flagellum omitted), from below; × 19/2.
— 5 g. Left mandible, from below; × 15.
— 5 h. Distal half of the same mandible, from above; × 22.
— 5 i. Left maxillula, from below; × 15.
— 5 k. Left maxilla, from below; × 15. *1.* basal joint; *2.* second very short joint produced laterally into the very long, distally cleft lobe, l^2; *3.* third joint bearing the exopod and produced laterally into the very long distally cleft lobe, l^3.

Plate IV.

Fig. 1. *Spongicoloides profundus* n. gen., n. sp. (continued).

Fig. 1 a. Left first maxilliped, from below; × 19/2. l^2. lobe from second joint; l^3. lobe from the third joint; *ex.* exopod; *ep.* epipod; *br.* rudimentary branchia (arthrobranchia).
— 1 b. Left second maxilliped, from below; × 19/2. *ep.* epipod; *arbr.* arthrobranchia; *pobr.* podobranchia.
— 1 c. Left third maxilliped, from below; × 19/2. *ep.* epipod; *arbr.* arthrobranchia; *plbr.* pleurobranchia.
— 1 d. Right first trunk-leg, from in front; × 14/3.

Fig. 1 e. Same leg; × 10.
— 1 f. Right third trunk-leg, from in front; × $^{14}/_{3}$.
— 1 g. Fifth left trunk-leg, from in front; × $^{14}/_{3}$.
— 1 h. Distal part of fifth leg; × 20.
— 1 i. Pleurobranchia of third trunk-leg; × 21.
— 1 k. Second left pleopod, from in front; × 5.
— 1 l. Telson and left uropod, from above; × 5. (All marginal setæ are plumose, but it could not be shown in the figure).

Fig. 2. *Acanthephyra Batei* Faxon (on the plate the synonym *A. brevirostris* Bate).

Fig. 2 a. Front half of the animal; × $^{3}/_{2}$.

Fig. 3. *Gnathophausia Zoëa* Will.-Suhm.

Fig. 3 a. Terminal part of the left mandible, from below, × 18. *c.* cutting edge; *lm.* lacinia mobilis; *m.* pars molaris.
— 3 b. Same part. from above; × 18. *l.* lacinia mobilis.
— 3 c. Terminal part of the right mandible; from above; × 18.
— 3 d. Left maxillula, from below; × $^{15}/_{2}$. *1.* first joint, from which the long lobe, l^1, proceeds; *2.* second joint; *3.* third joint produced into a long lobe; *4.* fourth joint; *5.* fifth joint. The uniformly greyish portions are membranous.
— 3 e. Left maxilla, from below; × $^{15}/_{2}$. *1.* first joint, without any lobe; *2.* second joint, from which the very long lobe, l^2, proceeds; *3.* third joint, produced into the long, distally cleft lobe, l^3, and bearing the exopod, *ex.*; *4.* fourth, and *5.* fifth joint, both without any lobe. The uniformly greyish areas are membranous skin.

Fig. 4. *Hansenomysis Fyllæ* H. J. H.

Fig. 4 a. Cephalothorax with the basal parts of the antennula and the antenna of an adult female, from the left side; × $^{26}/_{3}$. *VI.* and *VII.* sixth and seventh entirely free thoracic segments. *o.* ocular plate.
— 4 b. Front part of cephalothorax with antennulæ and antennæ of an adult male, from above; × 8.
— 4 c. Front part of the carapace with the basal parts of the right antennula and antenna of the female shown in fig. 4 a; × 8. *o.* ocular plate.
— 4 d. First right pleopod in the male, from behind; × 19.
— 4 e. Second right pleopod in the male, from behind; × 19.
— 4 f. Third right pleopod in the male, from behind; × 19.
— 4 g. Fourth right pleopod in the male, from behind; × 19.
— 4 h. Fifth right pleopod in the male, from behind; × 19.
— 4 i. Posterior part of abdomen in the male, from above; × 11.
— 4 k. Terminal part of the telson shown in fig. 4 i, from above; × 29.

Plate V.

Fig. 1. *Longithorax fuscus* n. sp.

Fig. 1 a. Female with the marsupium half developed; × scarcely 5. Most of the legs broken off.
— 1 b. Head of the same specimen, from the left side; × 8. Of the antennula only the two proximal peduncular joints present.
— 1 c. Same head, from above; × 8.
— 1 d. Right antennal squama, from above; × 23.

Fig. 1 e. Left mandible, from below; × 23.
— 1 f. Distal part of left mandible, from below; × 75.
— 1 g. Left maxillula, from below; × 44.
— 1 h. Left maxilla, from below; × 44.
— 1 i. Left maxilliped, from below; × 23.
— 1 k. Left first thoracic leg, from below; × 23. The exopod broken off.
— 1 l. Exopod of fourth thoracic leg; × 12.
— 1 m. Right sixth thoracic leg, from below; × 23. The exopod broken off.
— 1 n. Telson and uropods, from above; × 11. Distal part of both exopods broken off.
— 1 o. Distal part of the telson, from above; × 22. Some of the terminal and marginal spines broken or broken off.

Fig. 2. *Pseudomma roseum* G. O. Sars.

Fig. 2 a. Right antennal squama of an adult female from the "Ingolf" Stat. 27, from above; × scarcely 11.
— 2 b. Right antennal squama of an adult male taken by the "Thor", from above; × scarcely 11.

Fig. 3. *Pseudomma frigidum* n. sp.

Fig. 3 a. Ocular plate of a female with marsupium; × 11.
— 3 b. Right antennal squama of an adult female from the "Ingolf" Stat. 138, from above; × scarcely 11.

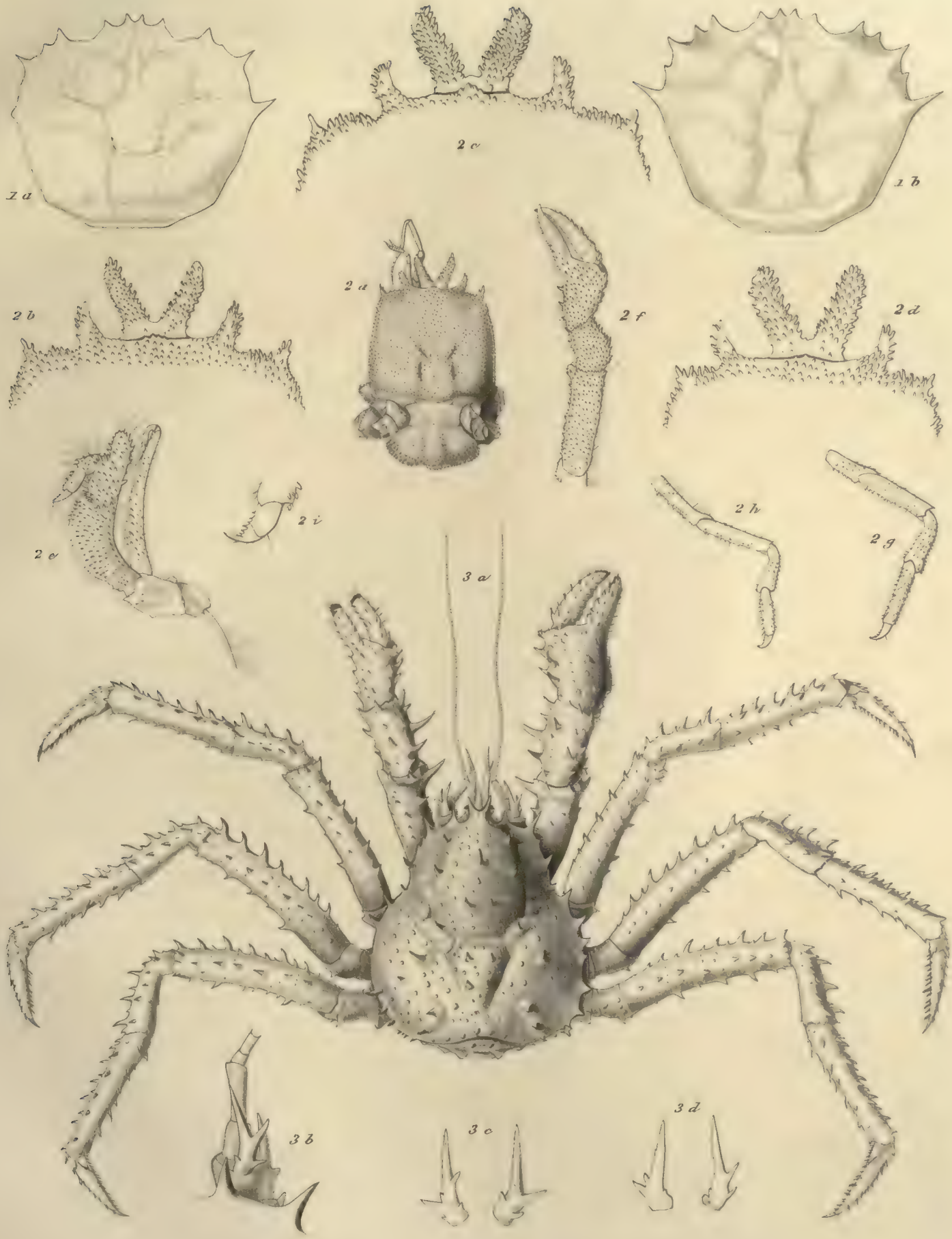
Fig. 4. *Pseudomma parvum* Vanhöffen.

Fig. 4 a. Ocular plate of an ovigerous female, from above; × 35.
— 4 b. Antennal squama of a male; × 26.
— 4 c. Left mandible of the adult female, from below; × 28.
— 4 d. Left maxilliped of the same female, from below; × 28.
— 4 e. Left first thoracic leg of the same female, from below; × 28.
— 4 f. Major part of the abdomen of the ovigerous female, seen from the left side especially in order to show the length of the pleopoda; × 12.
— 4 g. Telson and right uropod of the adult female, from above; × 21.
— 4 h. Telson of the same female; × 35.

Fig. 5. *Pseudomysis abyssi* G. O. Sars.

Fig. 5 a. Left eye-stalk of a male, from above; × 10.
— 5 b. Right first pleopod of a male, from behind; × $^{11}/_{2}$.
— 5 c. Inner ramus and basal part of the pleopod shown in fig. 5 b; × 12.
— 5 d. Right fourth pleopod of the same male, from behind; × $^{11}/_{2}$.

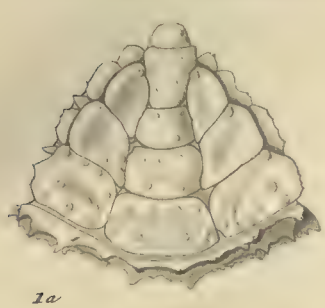
Among the figures, figs. 1 a and 1 b on Pl. I, and fig. 2 a on Pl. IV have been drawn by Mr. E. Bang; fig. 3 a on Pl. I, figs. 1 a, 1 b, 2 a, 2 f, 2 g, 3 a and 4 a on Pl. II, figs. 1 a, 3 a, 3 b, 4 a and 4 b on Pl. III have been drawn by Mr. Th. Bloch, but all have been corrected and frequently considerably altered by the author. All the remaining figures on the Plates have been drawn by the author.



1. Geryon affinis A. Milne-Edw. & Bouv. *2. Cymonomus Normani Lank.*

3. Paralomis spectabilis n. sp.

T. N. Möller sc.



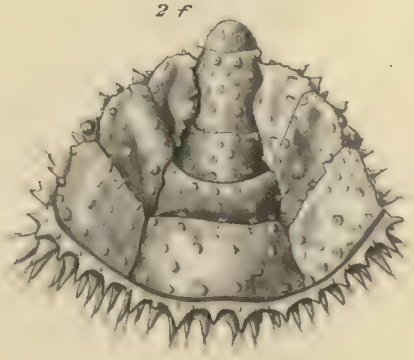
1a

1b

2 a

2 d

2 f

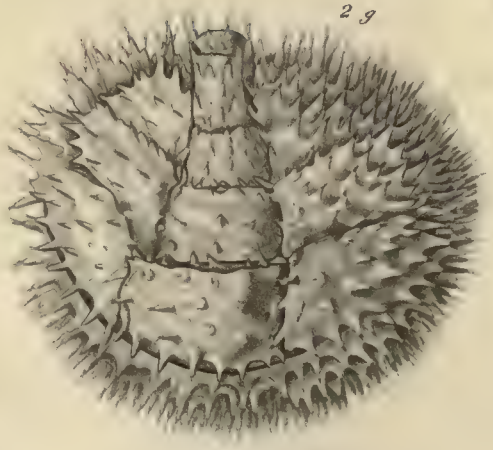


2 c

2 e

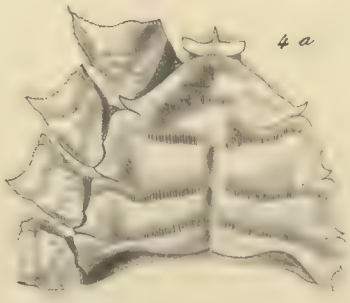
2 b

2 g



3 a

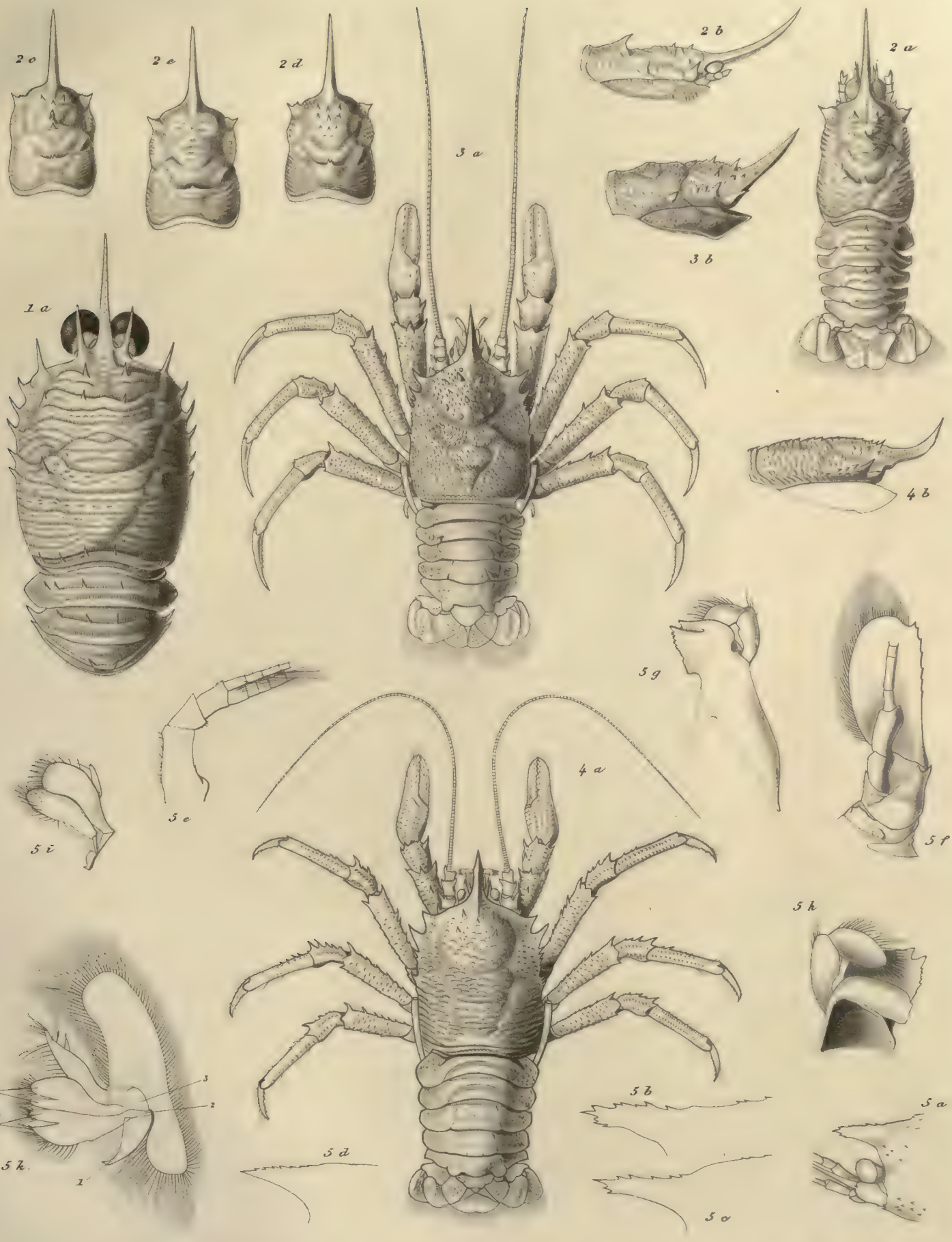
4 a



1. *Paralomis spectabilis* n. sp. 2. *P. Bouvieri* n. sp. 3. *Munida barnffica* Penn.

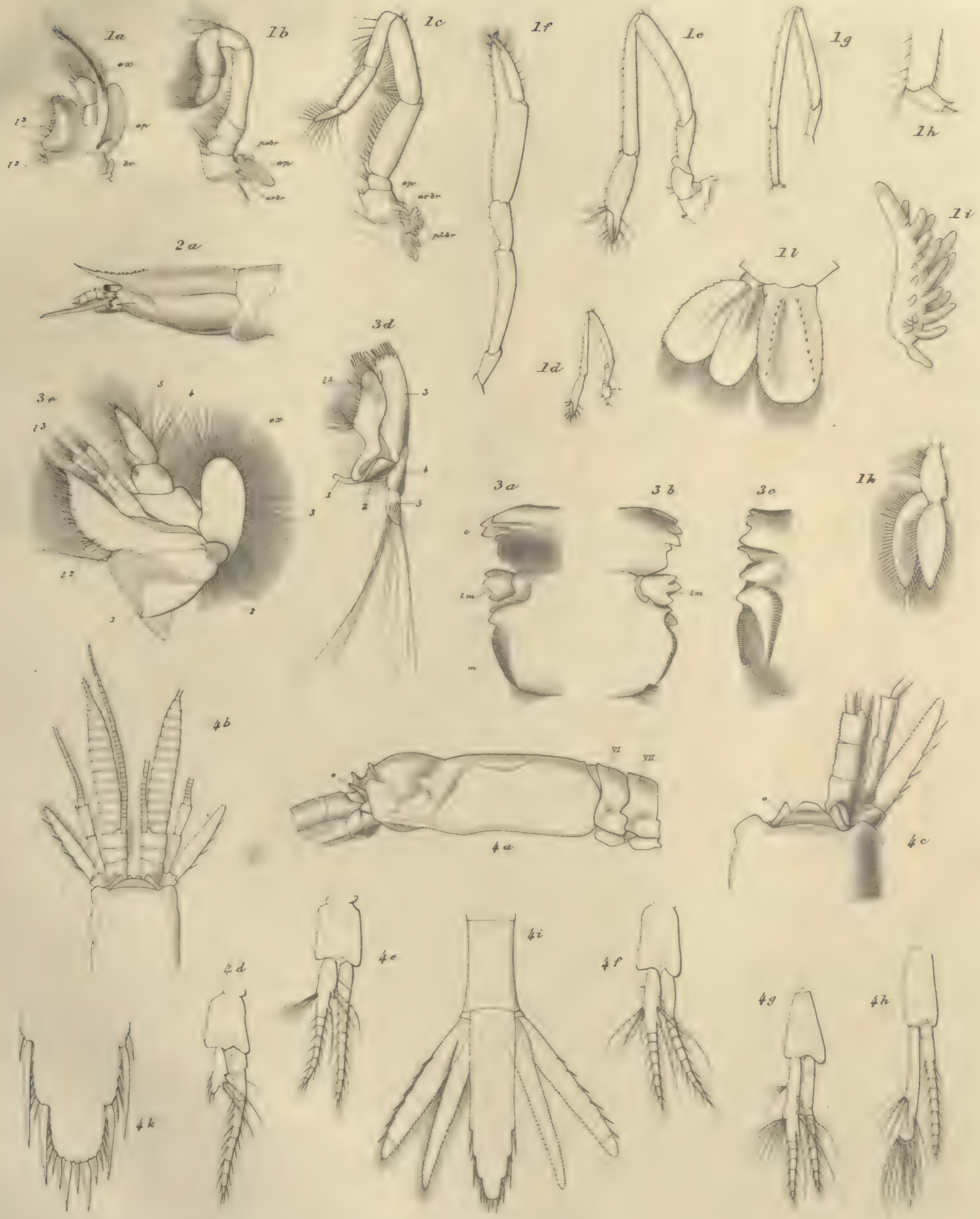
4 *M. tenuimana* G.O.S.

T.N. Möller sc.



1. Munida tenuimana G.O.S. 2. Munidopsis curvirostris Whit. 3. M. Antoniæ M.-Edw. & Bouv.
4. M. similis Smith. 5. Spongicoloides profundus n. gen. n. sp.

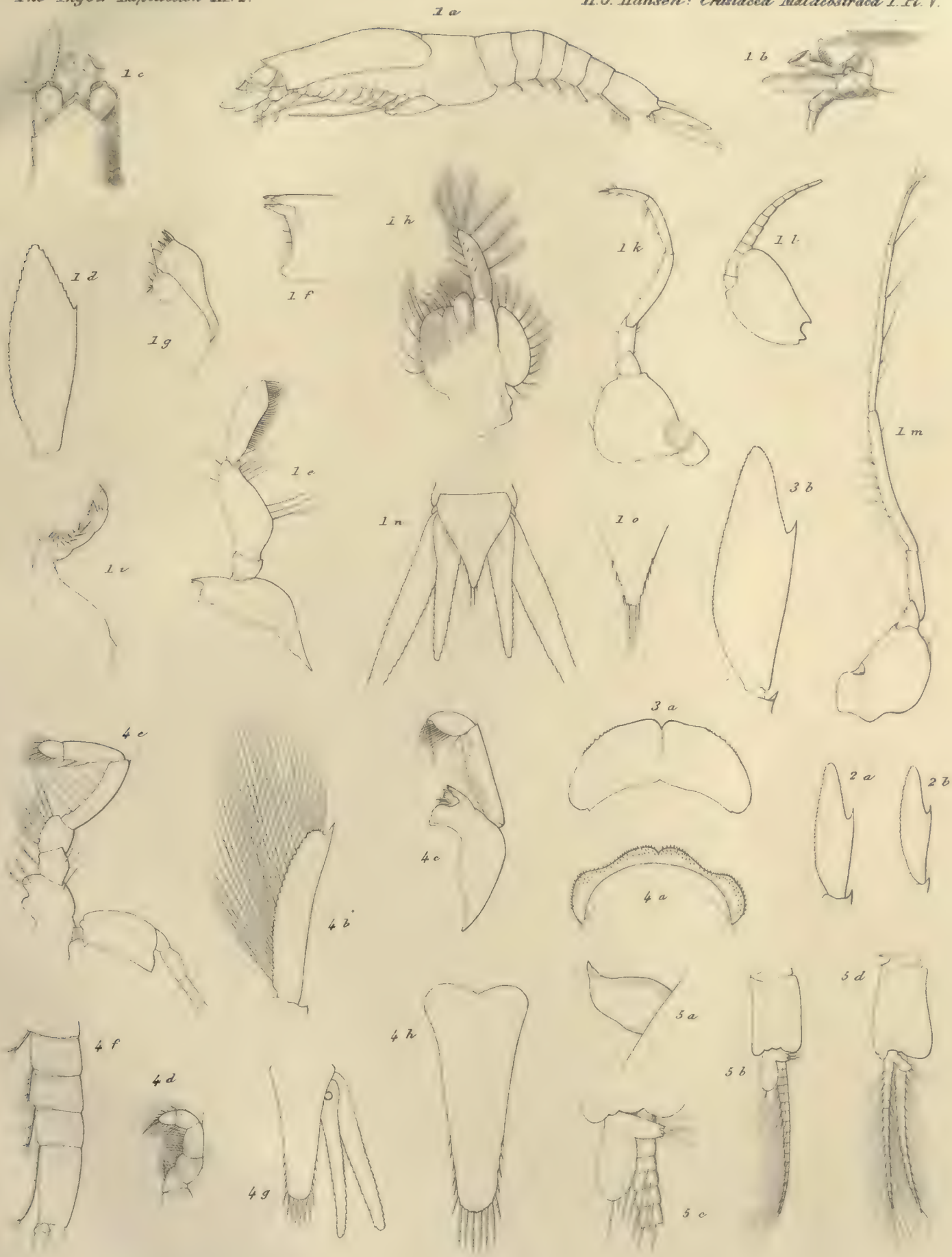
T.N. Møller sc.



1. Spongicoloides profundus n. gen. n. sp. *2. Acanthephyra brevirostris Sp. Bate* *3. Gnathophausia Zoëa W.-S.*

4. Hansenomysis Fylla HJH.

T.N. Möller sc.



1. Longithorax fuscus n. sp. 2. Pseudomma roseum G.O.S. 3. P. frigidum n. sp.

4. P. parvum Vanh. 5. Pseudomysis abyssi G.O.S.

H.J. Hansen del. T.N. 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	305	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.	Long. W.	Lat. N.	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					