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CONTENTS:

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

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WITH 12 PLATES AND A LIST OF THE STATIONS.

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IV. The Order *Tanaidacea.*

Introduction.

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

Our earlier knowledge of the Tanaidacea inhabiting the seas around Greenland, Iceland and the Færoes was poor. Only 9 species were known, 2 of which belong to the family Apseudidæ, 7 to the Tanaidæ. I am, however, inclined to think that no Carcinologist would have supposed that it might be possible to discover more than ten or fifteen new species within that area. But in the present paper I enumerate 78 species, all, excepting one, captured by Danish expeditions, and 52 of these species are new to science. The "Ingolf" has secured 71 of the species, but of these 13 have besides been taken by another Danish expedition or by two or more zoologists; 3 species have been gathered only by the "Thor" (Dr. Joh. Schmidt), 2 species exclusively by the second Amdrup-Expedition (Mag. sc. Soren Jensen) and a single species by other zoologists. In proportion to the number of species of Tanaidacea hitherto known from Norway, from Great Britain or from all seas together the "Ingolf" collection is so astonishing, that some special reason may be looked for; it may be of interest to attempt a discussion of the topic, and it may be possible to point out some results of more general significance. Finally a treatment of some other results and questions may be inserted before the purely systematic part.

On the Literature.

The earlier literature until the year 1881 comprises a good number of papers, but most among them dealing with only a single form or with some few species; the largest and most valuable of these contributions were written by H. Kröyer (1842) and W. Lilljeborg (1865). But in 1881 G. O. Sars published his paper: Revision af Gruppen: *Isopoda chelifera* (Arch. Math. og Naturv. Bd. 7), which is epoch-making in the history of our order. He divided it — he named it a group — into two well-

founded families, Apseudidæ and Tanaidæ, and pointed out their distinguishing characters; he established nine new genera (only five had been previously described); he enumerated nearly all species described from any ocean, and he added short descriptions of all species seen by him, redescribing a good number of species already made known and establishing twenty-three new species. He enumerated in all 3 genera and 14 species of the Apseudidæ, 11 genera with 46 species of the Tanaidæ, in all 14 genera with 60 species. But 4 species among the Apseudidæ were *nomina nuda* given by Norman, and Sars had overlooked a single species of *Apseudes* established by Willemoës-Suhm and two species of Tanaidæ established respectively by Nicolet and Bate. The result is that in 1884 59 species (not counting mere synonyms) of Tanaidacea had been established.

In 1886 G. O. Sars published his important paper: Middelhavets Saxisopoder (*Isopoda chelifera*), which contains elaborate descriptions with numerous excellent illustrations of seventeen species, all briefly described but not figured by him in 1880. And in his splendid work: An Account of the Crustacea of Norway, Vol. II, Isopoda (the parts on the Tanaidacea were edited in 1896—97) Sars published new descriptions and eighteen plates with figures of the Norwegian Tanaidacea, in all 28 species. By the three papers enumerated Sars has laid down a very broad foundation for future study and illustration of the animals, and he has done far more for the furtherance of our knowledge of the order than any other author.

Since 1881 about twenty-four zoologists have published descriptions of new species, sometimes besides of new genera, of Tanaidacea. Among these prominence must be given to the two English zoologists A. M. Norman and T. R. R. Stebbing, because in a valuable paper (On Crustacea Isopoda ... 1886) quoted several times in this report they gave good descriptions with numerous figures of 17 species (1 valid new genus), 13 of which were new and the majority even deep-sea forms; in other papers each of these two authors has described and figured some other forms. — In the Challenger Report Vol. XVII (1886) F. E. Beddard established 4 new genera and 10 new species, most of them interesting antarctic or deep-sea forms; unfortunately his figures are somewhat poor. — A. Dollfus has published preliminary descriptions, with some figures, of about 14 valid new species and 1 new and valid genus; in several papers published in later years Miss Harriet Richardson has established 2 new genera and several new species, mostly American.

In order to arrive at a fair idea of our knowledge of genera and species established before the middle of 1912 I have inspected the Zoological Records since 1877 and besides looked over the vast majority of the papers. I have attempted to count the genera and species hitherto established, excluding of course the synonyms, but it was impossible to arrive at absolute certainty as to the number of species, because in a few cases it cannot be made out whether a species is valid or ought to be cancelled as a synonym, and some few species have been so poorly described that they can scarcely be recognized with any certainty. But I am sure that the following numbers are nearly correct.

The family Apseudidæ comprises 8 genera: *Apseudes* Leach with 28 species, *Apseudopsis* Norm. with 2 species, *Parapseudes* Sars with 3 species, *Sphyrapus* Norman with 5 species, *Typhlapseudes* Bedd., *Leiopus* Bedd., *Kalliapseudes* Stebb. and *Pagurapseudes* Whitelegge, each with a single species. In all 42 species.

The family Tanaidæ comprises the following genera: *Neotanais* Bedd. (*Alaotanais* Norm. & Stebb.) with 5 species, *Tanais* H. M.-Edw. with 17 species, *Leptochelia* Dana with 16 species, *Heterotanais* G. O. S. with 9 species, *Paratanais* Dana with 9 species, *Nototanais* Richardson with 3 species, *Typhlo-*

tanais G. O. S. with 16 species, *Leptognathia* G. O. S. with 14 species, *Pseudotanais* G. O. S. with 5 species, *Cryptocope* G. O. S. with 4 species, *Haplocope* G. O. S. with 2 species, *Strongylura* G. O. S., *Anarthrura* G. O. S., *Mesotanais* Dollf., *Pancolus* Richardson, *Tanaissus* Stebb., *Tanaella* Norm. & Stebb. and *Bathytanais* Beddard, each with a single species. In all 18 genera with 107 species.

Thus the order Tanaidacea comprises 26 genera with about 149 species.

Results and Questions.

A. The "Ingolf" Collection.

According to the literature only 9 species have hitherto been known from the coasts of Greenland and the adjacent deep-sea area; the number of deep-sea species secured North of Lat. 56° N. by the English expeditions was small, and the excellent collector of small Crustacea Prof. G. O. Sars captured only 8 species of Tanaidacea during the Norwegian North-Atlantic Expedition. Judging from these and other facts every zoologist would have thought it to be a good result if the "Ingolf" had raised the number of species known from the seas around our northern dependencies to twenty or possibly twenty-five. But as already stated, the "Ingolf" captured 71 species of Tanaidacea, some other expeditions or travellers added 6 species, and a single deep-sea species enumerated in the literature as taken by the "Valorous" within the area in question was not found again. — Besides it may be stated, that a good number of the new species were taken by the "Ingolf" at several stations and sometimes in considerable numbers.

Of the 78 species only 8 belong to the Apseudidæ, but 70 to the Tanaidæ. The animals belonging to the Apseudidæ are on the whole considerably or much larger than the Tanaidæ and consequently far less overlooked by collectors. But as only 8 species — 3 among them new — of Apseudidæ were secured by the "Ingolf" and the "Thor", while 42 species are described in the literature from all seas together, the number of species from our northern area is not even one-fifth of species hitherto established. As to the Tanaidæ the result is very different; 106 species were known from all seas, but the "Ingolf", etc. captured 70 species, thus almost two-thirds as many as hitherto known. And 49 species of the Tanaidæ are new to science.

These excellent results are mainly due to a method of collecting introduced by me during the first "Ingolf" cruise. A considerable quantity of the mud hauled up by dredge or trawl, or the whole bottom material when its quantity was less considerable, was sifted under water in smaller portions in a sieve clothed with silk gauze no. 7 used by millers; the well-sifted contents of the sieve were put in alcohol and later examined at home in small portions, in water or alcohol, on the lower part of a cheese-cover under a moderately magnifying lens. In this way hundreds of small animals, as Tanaidacea, Asellota, etc., were gathered. Other deep-sea expeditions could certainly have arrived at corresponding results if their methods of dealing with the bottom material had been more satisfactory; it may be considered quite certain that hundreds of species of small Crustacea etc. lived in the bottom materials hauled up by the "Challenger" and later great European and North American expeditions and were flushed into the sea again.

B. Geographical and bathymetrical Distribution.

The fact that the "Ingolf" alone raised the number of species of Tanaidacea inhabiting the area explored from 9 to 72, thus to almost half the number of species known from the entire world, proves with absolute certainty that our knowledge of this order is still in its infancy. But an examination of the list of localities for each species affords further interesting results.

The major part of the 149 species previously known were taken exclusively or generally in depths from 0 to 50 or 60 fathoms, several species generally in depths from 50 to 200 or at most 300 fathoms, and scarcely twenty species — secured mainly by the "Porcupine", the "Valorous", the "Challenger" and "l'Hirondelle" — had been found generally or exclusively in depths more than 300 fathoms, sometimes in more than 1000 fathoms, and the greatest depth recorded is 2050 fathoms. But among the 52 new species established in this report about 44 were taken either most frequently or — and in most cases — exclusively in depths exceeding 300 fathoms and often in depths between 700 and 1870 fathoms. Some species formerly taken in lesser depths were now found to be not uncommon in considerable depths. Thus, the "Ingolf" discovered more than twice as many deep-sea species as hitherto recorded from all seas together, and the great majority among them are small, less than 3.5 mm. and generally 1.6—3 mm. long.

Another point of great interest is that the richest harvest was yielded by some of the deepest stations in the warm area South and West of southern Greenland. At Stat. 78 (South-West of Iceland) an enormous quantity of bottom material was hauled up from 799 fathoms and 9 species of Tanaidacea were found; at Stat. 32 (Davis Strait) the quantity of bottom material from 318 fathoms was very large and rendered 8 species. But at St. 38 (entrance of the Davis Strait) the bottom material procured from 1870 fathoms filled in sifted condition scarcely more than a good tea-cup, and in that I found even 9 species. And two of the stations West of South Greenland were still richer; the sifted material from Stat. 36, 1435 fathoms, was about a liter and contained 11 species, while from Stat. 24, 1199 fathoms, I have 12 species of Tanaidacea. The last-named station thus rendered 4 species more than the whole Norwegian North-Atlantic Expedition, about half as many species as hitherto known from the Mediterranean; the harvest from the four deep-sea localities Stat. 22, 24, 36 and 38 is in all 30 species, while Sars in his standard work from 1896—97 has only 28 species from Norway.

From all these statements we may safely draw the conclusion, that the deep sea with 1100 to 1870 fathoms in the warm area in the North Atlantic has a much richer fauna of Tanaidacea than any large northern or tropical part of the Atlantic along the coasts and with depths from 0 to 100 fathoms. And as it seems very improbable that the deep sea near South Greenland is proportionately richer than the deep sea of the subtropical or tropical Atlantic, the Indian Ocean or the Pacific, we may infer that hundreds of unknown species of Tanaidacea inhabit the deep areas of the Oceans, and that the fauna from about 300 and down to at least 2000 fathoms is much richer than the fauna living in depths between 0 and 300 fathoms.

In the list of the "Ingolf" stations we find thirty places with the temperature at the bottom below zero; these stations belong to the cold deep-sea area and their depth ranges from about 300 to 1300 fathoms. Of our Tanaidacea 8 species are exclusively from these stations. The warm deep-sea

area is more difficult to define, but it may be proposed that the stations with a depth between 300 and 600 fathoms and the bottom temperature not below 3°, and all stations with depth from 600 to 1870 fathoms and the temperature above zero belong to that area. When we adopt this view it will be found that about 38 species enumerated in the following pages were taken exclusively in this warm deep-sea area, which consequently has a much richer fauna than the cold deep-sea area. A somewhat small number of species (*Sphyrapus anomalus* G. O. S., *Pseudotanais affinis* H. J. H., *Typhlotanais mixtus* n. sp. *Leptognathia longiremis* Lilljeborg, *L. ventralis* n. sp., *L. breviremis* Lilljebg., *Cryptocope arctica* H. J. H. and *Strongylura cylindrata* G. O. S.) have been taken both in the real cold deep-sea area and at rather deep or very deep stations in the warm area; but with a single exception (*Typhlotanais mixtus*) all these species have besides been taken in depths of less than 100 fathoms either by the "Ingolf" or at Norway, at East Greenland or in the Kara Sea. — The majority of the remaining species are forms living in depths less than 300 and frequently less than 100 fathoms. Some few species (as *Leptognathia inermis* n. sp., *L. Sarsii* H. J. H., *L. subæqualis* n. sp. and *L. latiremis* n. sp.) cannot be referred to any of the three categories just mentioned, but they seem to be essentially cold water forms sometimes found in temperatures a little above zero; *L. subæqualis* was once taken even in 318 fathoms in a temperature of 3.9°.

C. Sexual Differences in the Tanaidæ.

Adult males of species of the family Apseudidæ are frequently taken together with the females, and I am unable to add anything to our knowledge of the sexual differences in this family. Sars has published excellent figures of both sexes of the two Norwegian species *Apseudes spinosus* M. Sars and *Sphyrapus anomalus* G. O. S., of *Sphyrapus serratus* G. O. S. and of a few species of *Apseudes* from the Mediterranean. In the males the abdomen is generally longer in proportion to the thoracic segments, the pleopods and their setæ are longer, the flagella of the antennulæ and antennæ and the endopod of the uropods are longer and divided into a larger number of joints than in the females; furthermore, the chelipeds of the males differ somewhat or very much from those of the females, and sometimes the second pair of thoracic legs show some difference.

As to the family Tanaidæ our knowledge of the males is still very imperfect and some interpretations are erroneous; it is necessary to distinguish sharply between adult and subadult or immature males. Sars has described the females of 26 species of Tanaidæ from Norway, but he was acquainted with really adult males of only 5 species, viz. *Tanais Cavolinii* M.-Edw. (*T. tomentosus* Kr., G. O. S.), *Heterotanais Oerstedii* Kr., *Typhlotanais finmarchicus* G. O. S., *Paratanais Batei* G. O. S. and *Leptognathia Sarsii* H. J. H. (*L. longiremis* G. O. S., not Lilljeborg); he described also what he believed to be the males of *Anarthrura simplex* G. O. S. and *Pseudotanais forcipatus* Lilljebg., but his animals were only subadult males, not adult specimens, and at least the adult male of the last-named species (already described, without figures, by Lilljeborg) is widely different from the subadult stage. Sars was aware that his males of *Strongylura cylindrata* G. O. S. were "probably" immature, which in reality was the case. In 1885 he figured the adult male of *Cryptocope Vöringii* G. O. S.; in his paper on the Mediterranean forms he figured the adult males of *Leptognathia brevimana* Lilljebg., *Heterotanais*

anomalus G. O. S. and of species of *Leptochelia*. — Adult males of some few other species have been described by Moore, Stebbing, etc.

A study of Sars' descriptions and figures of adult males as compared with the corresponding females is interesting. In *Tanais Cavolinii* M.-Edw. (*T. tomentosus* Kr., G. O. S.) female and male seem to differ only by the chelæ, which in the male are very broad, strongly forcipate and without tubercles on the fingers, while in the female they are rather slender, scarcely forcipate and with two tubercles on the fixed finger. The males of all other above-mentioned forms differ much more from their females. In *Heterotanais Oerstedii* Kr. the male has the cephalothorax produced in a very long and thin "neck", the antennulæ and the antennæ are longer and thinner than in the female, the antennulæ five-jointed in the male, three-jointed in the female, and the chelipeds are quite anomalously shaped in the male, normal in the female. The males known belonging to *Paratanais, Typhlotanais, Leptognathia* and *Cryptocope* differ from their females in many particulars: the antennæ are six-jointed when three-jointed in the female, seven-jointed when four-jointed in the female, and have besides in all genera tufts of sensory hairs on three of the joints; the thoracic segments are conspicuously shorter in proportion to carapace and abdomen than in the females; the chelipeds or at least the chelæ differ somewhat or considerably in shape and equipment from those of the females: the thoracic legs are somewhat or considerably longer and more slender, the abdomen is larger, its pleopods longer with longer setæ and the uropods at least a little longer than in the females; finally in *Paratanais* the eyes of the males are much larger than in the females. The males of *Leptochelia* differ from their females especially in having much larger eyes, the chelipeds elongate with the chelæ very differently shaped and the antennulæ divided into a good number of joints. (It has been stated that in the males the mouth-parts are generally more or less reduced, but the majority of the males described have not been very closely investigated in that respect).

With a single exception (*Cryptocope Vöringii* G. O. S.) all species of which the adult males are known, inhabit comparatively low water, from the beach down to 30 or 50 fathoms. And according to the sexual differences just pointed out the adult males of most genera differ in general aspect and in several characters more from their own females than from males of other genera, and the differences between the two sexes of the same species are most frequently larger than the differences between the female of that species and females of several other genera. The result is that not unfrequently it is impossible with certainty to refer a male to its female, to determine specimens of the male sex.

While my material of females and immature specimens dealt with in this report is exceedingly large, comprising probably a good deal more than a thousand specimens, I have very few adult males. I establish a new species of *Neotanais* on a male about twice as long as any male or female hitherto known of this family from any sea. Furthermore, I have 5 males belonging to 3 species of *Pseudotanais*, 5 males belonging to 3 species of *Leptognathia* and a male *Cryptocope*, in all 11 specimens referred by me to 7 species; the reference of males to five of these species is absolutely certain, but two are referred with a little less certainty. Finally, I have still two males, one of which with a peculiarly armed chela, but being unable to refer them to genus I found it useless to describe them. But this enumeration of 14 adult males as compared with the enormous number of females and

immature specimens of both sexes proves that adult males must be either very rare or, and much more probably, that they swim about and are therefore rarely taken with the trawl or the dredge.

Immature or subadult males of many species were taken together with the females. In all species with the pleopods quite rudimentary or wanting in full-grown females with or without marsupium such subadult males are instantly recognized by having moderately developed or even somewhat large pleopods; this is the case in several species of *Leptognathia*, in *Pseudotanais forcipatus* and *P. Liljeborgii*, in *Agathotanais*, *Leptognathiella*, *Strongylura*, *Paranarthrura*. In all these forms the subadult males have the abdomen proportionately either a little or, as in *Paranarthrura insignis* n. sp., considerably longer than the female. In the genera with the antennulæ four-jointed these appendages, and especially their two proximal joints, are generally conspicuously thicker in the subadult males than in the females, and in some species of *Leptognathia* (f. instance *L. armata* n. sp.) the antennulæ of the subadult male are five-jointed, as the fourth joint has its basal part marked off by an articulation. In species of *Pseudotanais* or *Leptognathia* with the pleopods well developed in the female and in all species of *Typhlotanais* the antennulæ alone afford readily distinguishable differences between females without marsupium and subadult males. In *Typhlotanais* the main difference is the thickness of the two proximal joints and of a portion of the third joint; in *Pseudotanais* we find generally the basal part of the third antennular joint somewhat thickened and besides protruding below.

It is a common rule that when a good material of full-grown females of a species is to hand, the great majority are without marsupium, even when taken at the same station. But it is a curious fact that in several cases some of the largest specimens without marsupium are a little longer than the longest specimen with marsupium; this fact I cannot explain, but I am induced to think that some reduction in size may accompany the development of the marsupium and the eggs. In females with marsupium the ventral surface of the lamelligerous or of all thoracic segments is rather or quite flat, in specimens without marsupium most frequently considerably convex, but specimens without marsupium are sometimes found showing the ventral surface flat and on the whole showing an appearance as if the marsupial lamellæ had been lost, but whether this has been the case is impossible to decide.

In females without marsupium and subadult males of several species of *Typhlotanais* and of *Leptognathia ventralis* n. sp. the second thoracic segment is below, and generally at or not very far from the front ventral margin, produced in a generally acute and sometimes large process directed downwards and more or less forwards; in females with marsupium and in very few cases in female specimens without marsupium (perhaps lost) but with the lower side of the thoracic segments nearly or quite flat this process is either reduced in size and shape (*Leptognathia ventralis*) or lost (*Typhlotanais*). — In *Typhlotanais microcheles* G. O. Sars females without marsupium and with the ventral side of the thoracic segments convex, the ventral process is found on all thoracic segments excepting on the seventh (vid. "Remarks" on *T. gracilipes* n. sp.) — In *Paranarthrura insignis* n. gen., n. sp., the females without marsupium and subadult males have a conspicuous process on the ventral side of all thoracic segments, but in females with marsupium only the process on the seventh segment has been preserved.

D. Some morphological Features in Agathotanais n. gen.

Among all the new species described in the present paper only one, viz. *Agathotanais Ingolfi* n. gen., n. sp. shows hitherto unknown features of more general interest. Both females without marsupium and subadult males are at hand (Pl. VI, figs. 5a—5o). In the female the antennæ consist of a single minute joint (fig. 5c); in subadult males this joint is considerably larger (fig. 5n). In all specimens the seventh thoracic segment and all abdominal segments are immovably fused, but the limits between the segments are tolerably indicated by fine furrows (figs. 5b and 5o). The pleopods are wanting in the female (fig. 5b); in the subadult males they are rather long, unjointed, very slender conical and all coalesced, constituting a kind of pyramid with longitudinal furrows between the pairs, and each pleopod terminates in a few very short setæ (fig. 5o). The uropods are rudimentary, each being a small, subtriangular joint without any distinct division (figs. 5l and 5m).

Among these features the rudimentary state of antennæ and uropods are mere reductions, which yet are much stronger than in any other genus. The fusion of seventh thoracic segment and all abdominal segments is still more interesting. But completely without parallel among Crustacea is the fact, that in the subadult male all five pairs of pleopods are coalesced forming a single somewhat long protuberance, and this fact is of importance for comparison with features found in mouth-parts in a couple of groups of high rank of terrestrial Arthropoda.

E. On the naming of Segments and Joints.

Before entering on the systematic part it may be useful to say a little on the counting of the segments and joints and the terms used in the descriptions.

As the first thoracic segment is always fused with the head and hidden beneath the carapace, the apparently first segment is in reality the second, consequently it is here named the second and its legs the second pair, while the first pair of legs, the chelipeds, as belonging to the cephalothorax, are described separately.

The counting of the antennular joints presents no difficulty. But the antennæ are less easy. When the antennæ of females are fully developed they contain seven joints, as is seen in many species of *Leptognathia*. The first joint is very short, frequently nearly triangular, as the posterior margin is oblique and the upper margin very short or wanting; this joint is sometimes difficult to perceive and I never describe it, but it must of course be taken into consideration by counting. The two next joints are somewhat short and the third as a rule shorter than the second; in a couple of species of *Typhlotanais* these joints are strongly armed below. Fourth and fifth joints are somewhat long, but frequently, as in *Typhlotanais*, in some species of *Leptognathia*, in *Paranarthrura*, etc., fused, constituting a single long or very long joint sometimes with a vestige of division. Sixth joint is well developed, seventh always very small.

The thoracic legs have always the second joint long; the first joint is quite short but most frequently discoverable. The "claw" on the sixth joint is composed of the seventh joint and the real claw, and the limit or suture between these two parts is most frequently distinct. In the descriptions the joints are named according to their real number.

The chelipeds are somewhat difficult. In *Apseudes* a cheliped seems to consist of only five joints instead of seven plus claw. But the presence of an exopod on the first joint proves that it is the second (according to the earlier morphology), and from a comparison with the second pair of legs it is evident that the long joint preceding the chela has been formed by the complete fusion of two joints; finally, the movable finger of the chela answers to the "claw" in the following legs, thus consisting of seventh joint and the real claw. In most genera of Tanaidæ the chelipeds consist of the same five joints as in *Apseudes*, but in several forms, as in the male of *Neotanais giganteus*, in *Cryptocope Vöringii* and *C. arctophylax* and above all in *Anarthrura* (comp. Sars' figures) we find a conspicuous piece developed as a separate plate or (in *Anarthrura*) a large real joint between the usual "first" joint and the body; this plate or joint is certainly the real first joint which in most forms of the order is feebly or not marked off from the cephalothorax. As the chelipeds show such tangled morphology I have abstained from applying the counting method when the joints to be described must be indicated. Therefore I use some of the names applied by H. Milne-Edwards to the joints of the legs in Decapoda; whether most of the joints in the legs of Tanaidacea and Decapoda can be considered identical as to morphological value according to their number is another and very difficult question not to be discussed here. The apparently first and very conspicuous joint of the chelipeds in most forms is named the basal; the real first joint in *Anarthrura* and the plate marked off in the forms just enumerated is named the coxal joint. The joint beyond the basal is named the ischium, but in most forms it affords no character worth mentioning. The next joint is named the carpus, though morphologically it answers to meros and carpus; in the descriptions of the chela I speak of hand and fingers, the hand going to the insertion of the movable finger.

F. On generic and specific Characters.

In this report I establish only three genera, all belonging to the Tanaidæ. Two of these are well separated, but the third, founded on a single specimen, was established only because it fits badly in the genera known, though it does not seem to possess any single really good generic character. The big genus *Leptognathia* is divided into groups, and in the future it will certainly be divided into three or four genera, but I think it better to postpone this splitting up until a good number of unknown forms have been discovered, because the Carcinologist will then be more able to settle the value of several characters, whether they may be considered of generic or only of specific value. And here we fall in with a difficulty. It is with good reason that Sars laid stress on the mouth-parts in females (and immature males) as affording generic characters and especially on the development of the mandibles and the shape of their molar process, if that is present. But of numerous new species the material is very scanty or even consisting of only a single specimen, and in such cases an examination of the mouth-parts was postponed. Furthermore many species are so small, that several Carcinologists dealing with such animals are scarcely able to dissect the mouth-parts in such a way that a good representation of the mandibles can be given. And by the examination of the mouth-parts in various species of *Leptognathia* I found that two such species as *L. subæqualis* n. sp. and *L. ventralis* n. sp., which are rather allied in most characters and may be referred to the same group, show

in the shape and equipment of the molar processes such differences as those judged by Sars to be of generic value. The result is that the value of the shape of the molar processes as generic characters is lessened both from a scientific and a practical standpoint.

Though the descriptions of species published by G. O. Sars, Norman and Stebbing on the whole must be considered good, some of the characters in the family Tanaidæ used by these authors are scarcely sufficiently sharp, as a larger number of species have been discovered and it can be proved than hundreds of species are still undiscovered. While drawing the figures I found it necessary to use the ocular micrometer very much in order to figure as exactly as possible not only the relative length of the segments and of the joints of all appendages, but besides the exact proportion between length and breadth or depth of the joints of the chelipeds, the antennulæ and the peduncles of the uropods. Very frequently it is stated in the following pages that a joint is somewhat less than twice as long as deep or more than half as long again as another joint, etc., and in all such and several other cases the statements are founded upon measurements. As some slight individual variation exists and in some cases may be more pronounced, the proportions stated may sometimes be only approximative, but in spite of such variation I thought it better to give statements based on measurements than such founded on measuring by the eye.

Especially the relative length and breadth or depth of some of the joints of the chelipeds afford excellent specific characters, but care must be taken that the joints are seen exactly from the side, as an oblique position of a joint produces an erroneous impression as to the relative dimensions. The shape and length of all or of the three proximal joints of the antennulæ are also valuable. The processes on the ventral side of the abdominal segments in *Cryptocope Vöringii* G. O. S. and *C. arctophylax* Norm. & Stebb. were pointed out in the literature, but in many species of *Leptognathia* the presence or absence of ventral tubercles or of a peculiar process afford valuable characters. But it is scarcely necessary to say more on these topics, as the perusal of a few descriptions of species belonging to different genera may elucidate the methods applied.

Fam. I. Apseudidæ.

This family comprises eight genera, but only two are represented in the collection.

Apseudes Leach.

In the literature twenty-eight species have been established. The "Ingolf" captured three species, one of which is new; furthermore two species, both new, have been secured by the "Thor".

1. Apseudes spinosus M. Sars.

1859.	*Rhoëa spinosa*	M. Sars, Forh. Vid. Selsk. Christiania for 1858, p. 30.
1886.	*Apseudes spinosus*	Norman & Stebbing, Transact. Zool. Soc. London, Vol. XII, Pt. IV, p. 85, Pl. XVII, fig. 1.
! 1896.	— —	G. O. Sars, Account Crust. Norway, Vol. II, p. 7, Pls. I—II.

Remarks. As to this species I refer to Sars' description and good figures. It may only be mentioned that the largest of the females measures 13.8 mm. and was taken by the "Ingolf"; the largest male, 12 mm. long, is from Lat. 60° 5′ N.

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

West Iceland: St. 87: Lat. 65° 02.3′ N., Long. 23° 56.2′ W., 110 fm.; 7 spec.

The "Thor" has secured it at 3 stations:

South of Iceland: Lat. 63° 46′ N., Long. 22° 56′ W., 80 fm.; 1 spec.

— - — Lat. 63° 15′ N., Long. 22° 23′ W., 114—172 fm.; 5 spec.

South-West of the Færoes: Lat. 61° 15′ N., Long. 9° 35′ W., 400—500 fm.; numerous spec.

Distribution. The species occurs along the whole coast of Norway, from Vadso to Christiania Fjord, in depths from 30 to 150 fm. (G. O. Sars), and even 180 fm. (Norman). It has been taken off Bohuslän (Lilljeborg), in the eastern part of Kattegat, 17 to 30 fm. and in Skager Rak, 70 to 226 fm. (H. J. Hansen). Between the Shetland Islands and Norway it has been taken two times by Caud. mag. Ad. Jensen ("Michael Sars") in 1902: Lat. 61° 0′ N., Long. 2° 35′ E, 150 fm., temp. 7.9°, 1 spec., and Lat. 60° 5′ N., Long. 3° 42′ E., 190 fm., temp. 6.1°, 21 spec.; the "Thor" secured it near the Orkney Islands: Lat. 58° 32′ N., Long. 4° 18′ E., 150 fm. Tattersall has enumerated it from three places West of southern Ireland and in such depths as 293, 320 and 375 fm., and according to Norman & Stebbing it was taken off S. S. W. Ireland in 725 fm. — According to Norman *Apseudes Koehleri* Bonn., established on a specimen from the Bay of Biscay, is to be cancelled as a synonym to *A. spinosus;* but judging from Bonnier's drawings that reference is still somewhat doubtful.

2. **Apseudes vicinus** n. sp.

(Pl. I, figs. 1 a—1 c.)

Immature Female. Allied to *A. spinosus* M. Sars, but differing in a number of features. — The eye-lobes (fig. 1 a) are more produced and more excavated in front than in *A. spinosus,* with the result, that the transverse portion is very short and the outer process long, acute; the lateral process behind the eye-lobe is more conspicuous than in the form mentioned, with the anterior margin somewhat arcuate and the outer angle acute and a little produced. The lateral margin behind last-named process is nearly straight excepting in front. The upper surface of the carapace with the transverse furrow very distinct, long.

The antennulæ in the main as in *A. spinosus;* the first joint with the proximal half of its inner margin serrate; the outer flagellum 8-jointed, the inner 4-jointed and somewhat more than half as long as the outer. Antennæ with the flagellum 7-jointed; the squama reaches the end of the penultimate joint of the flagellar peduncle.

Chelipeds (fig. 1 b) nearly as in *A. spinosus*, but the lower margin of the carpus is somewhat longer than that of the ischium while in *A. spinosus* the lower margin of the carpus is shorter than that of the ischium and provided with two teeth not found in *A. vicinus.*

Thoracic segments somewhat longer in proportion to breadth than in *A. spinosus*, and the

lateral margins of the four posterior segments show considerable difference from *A. spinosus*, as in *A. vicinus* the anterior lateral process of each of these segments is much broader at the base, and this proximal part has a short, triangular protuberance both in front of and behind the main part of the process; furthermore the angle in front of the basal joint of each leg is produced into a small, acute protuberance. The ventral surface of the segments with acute processes as in *A. spinosus*. — Second pair of legs (fig. 1 c) with a strong spine both from the anterior (upper) and the lower (posterior) angle of fourth joint, with a spine from the upper angle and two spines on the lower margin of fifth joint, while the sixth joint has two spines on the upper and five on the lower margin; fifth joint as long as the sixth and a little shorter than the fourth, while in *A. spinosus* the fifth joint is considerably shorter in proportion to the fourth.

Abdomen scarcely as long as the sum of the three posterior thoracic segments plus half of the fourth. The lateral processes of the five anterior segments somewhat long but distinctly shorter than in *A. spinosus*, the short terminal part of each process is suddenly slender. Sixth segment as long as the three preceding segments and half of the second segment combined, a little more than two and a half times as long as broad at the middle; the major anterior part of each lateral margin with six very feeble protuberances, each bearing a conspicuous seta. (Uropods lost excepting their basal joint.)

Length of the single immature female 6.3 mm.

Remarks. Among the characters enumerated in the description the shape of the eye-lobes, the processes on the lateral margins of the four posterior thoracic segments and the relative length of some of the joints in the chelipeds and second pair of legs are most easily observed.

Occurrence. Only taken by the "Thor" at the following locality.

South of Iceland: Lat. 62° 57′ N., Long. 19° 58′ W., 505 fm.; 1 spec.

3. **Apseudes tenuis** n. sp.

(Pl. I, figs. 2 a—2 e).

Subadult Female. The eye-lobes are strongly produced and acute (fig. 2 a), almost as much as in *A. vicinus*. The lateral process of the head shaped nearly as the eye-lobe; the lateral margin behind the last-named process considerably convex. The upper surface of the carapace with the transverse furrow very distinct, long.

The antennulæ more slender than in the preceding species; first peduncular joint more than four times as long as the second and with the proximal half of the inner margin distinctly serrate; the inner flagellum 10-jointed, more than two-thirds as long as the outer which is 13-jointed. — Antennæ (fig. 2 a) with the flagellum 9-jointed and the squama not reaching the end of the penultimate joint of the flagellar peduncle.

Chelipeds (fig. 2 c) considerably more slender than in *A. vicinus* but conspicuously stronger than in the two following species. Basal joint on the posterior margin with some minute spiniform setæ on the proximal part and somewhat before its end a very protruding angle bearing a strong spine, while the anterior margin is furnished with some setæ; the ischium has two spines near the end of the lower margin; the carpus slender with the lower margin unarmed and more than half as long

again as the lower margin of the ischium. The chela almost four times as long as broad, with the posterior margin slightly concave; the movable finger half as long again as the front margin of the hand.

Thoracic segments (figs. 2a and 2b) a little more slender than in *A. vicinus;* second segment as long as the third. Five posterior segments with their anterior lateral processes in the main shaped as in *A. vicinus*, excepting that their distal part is more slender and generally more produced; a lateral, sharp, triangular protuberance in front of the insertion of the legs on the four posterior segments. — Second pair of legs (fig. 2d) a little more slender than in *A. vicinus;* fifth joint slightly longer than the sixth and as long as the fourth; second joint with a strong spine on the distal lower angle; fourth joint with a long spine both on the upper and the lower distal angle; fifth joint with a terminal upper spine and two strong and distant spines on the lower margin; sixth joint twice as long as broad; with two spines above and six below; seventh joint with a minute tooth below at the middle. Seventh pair of legs (fig. 2e) with second joint nearly five times as long as broad; the following joints are rather slender; sixth joint twice as long as the seventh which is nearly as long as the claw.

Abdomen (fig. 2b) differs somewhat from that in *A. vicinus*. The lateral processes of the five anterior segments are long, distally more slender and directed more obliquely backwards than in that species. Sixth segment a little less than the combined length of second to fifth segment, scarcely less than three times as long as broad at the middle and with six pairs of lateral setæ originating from minute tubercles. — (Uropods lost).

Length of the largest specimen, a female with small marsupial lamellæ, 10 mm.

Remarks. This species is intermediate between the two preceding more robust forms, *A. spinosus* and *A. vicinus*, and the two following very slender species. It is more similar to the latter forms by the slender chelæ, but differs strongly from these and is rather allied to the two first-named species by the long and strong lateral processes on the abdomen, the serrate proximal half of the inner margin of first antennular joint, etc.

Occurrence. The "Ingolf" has taken this species at two deep-sea stations:

Davis Strait: St. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fm., temp. 2.4°; 2½ spec.

Denmark Strait: St. 11: Lat. 64°34′ N., Long. 31°12′ W., 1300 fm., temp. 1.6°; 2 badly preserved spec.

4. **Apseudes gracilis** Norm. & Stebb.

(Pl. I, figs. 3a—3d.)

1886. *Apseudes gracilis* Norman & Stebbing, Transact. Zool. Soc. London, Vol. XII, Pt. IV, p. 95, Pl. XX.

Subadult Female. As it disagrees with the description and figures of the English authors in some particulars, the more essential features may be mentioned.

The eye-lobes (fig. 3a) have the outer distal angle produced in a thin, moderately short process directed nearly forwards. The lateral processes somewhat small, but otherwise shaped and directed about as the eye-lobes. The surface of the carapace has no transverse furrow.

Antennulæ (fig. 3a) somewhat short; the first joint somewhat short, about two and a half times as long as the second, without serration on the inner margin; the outer flagellum 13-jointed, a little shorter than the sum of the two proximal peduncular joints and four times as long as the short,

3-jointed inner flagellum. — Antennæ with the squama conspicuously shorter than the penultimate joint of the flagellar peduncle; the flagellum 8-jointed.

Chelipeds (fig. 3 b) agreeing with the figure of Norman & Stebbing, thus rather slender and without any spine or tooth on the posterior or lower margin of the joints. Basal joint not fully four times as long as broad; lower margin of the carpus half as long again as that of the ischium. Chela almost three and a half times as long as broad, with the posterior margin somewhat concave; movable finger conspicuously more than half as long again as the front margin of the hand and considerably overreaching the fixed finger, which has the major part of the distal half of its incisive margin finely serrate (fig. 3 c) and a number of setæ inserted on the outer side along the serration.

Second thoracic segment, seen from above (fig. 3 a), has the first joint of its legs triangular with the front margin even sloping a little backwards and the outer angle produced a little forwards; third segment with the outer angle acute and produced slightly forwards. The four posterior segments more slender than in *A. vicinus;* their lateral process proportionately somewhat small with the terminal part thin and no protruding proximal angle in front or behind; each segment furthermore with a small or rather small process on the ventral surface. — Second pair of legs (fig. 3 d) somewhat slender; second joint without any spine at the posterior distal angle; fourth joint even slightly longer than the two following joints combined, without any spine above or below at the end, but with a number of setæ on the upper part of the outer side and along the distal half of the lower margin; fifth joint slightly shorter than the sixth and even slightly broader than long, with a terminal upper spine and two spines on the lower margin; sixth joint distinctly less broad than the fifth, not much longer than broad, with two distal spines above and eight spines along the lower margin; seventh joint with two denticulations below. — (Seventh pair of legs lost in the specimen).

Abdomen about as long as the four posterior thoracic segments combined, slender. Five anterior segments not fully as slender but otherwise shaped nearly as in the following species, thus with the processes from the postero-lateral angles thin and very short, but without processes below. Sixth segment about as long as the sum of the four preceding segments, not fully four times as long as broad, without minute lateral tubercles or setæ. — (Uropods lost).

Length of the specimen described, a female with the marsupial lamellæ very small, 13 mm.

Remarks. The subadult specimen agrees with the description of Norman & Stebbing in some important characters: the antennulæ without serration on the first joint and a very short, 3-jointed inner flagellum (according to the text of the English authors this flagellum is 4-jointed, but the figure has only 3 joints), the antennal squama short, the general shape of the chelipeds with setæ on the fixed finger and no spines on any joint, finally the shape and armature of the joints of seconds legs excepting that the lower margin of sixth joint has only 8 spines instead of 10. But it differs in several features: the processes of the cephalothorax and thoracic segments are much smaller than according to the English figures, the abdomen has no processes below and no tubercles on the last segment, the movable finger of the chelæ is longer than the fixed, finally some further particulars to be found by a comparison of my text with the description of Norman & Stebbing. I am, however, apt to think that my immature specimen is only a kind of variety of *A. gracilis*, not a separate species, and especially the shape and armature of the joints of second pair of legs bear strong witness for this view.

Together with the specimen described a very young specimen, measuring only 5.7 mm. and with seventh pair of thoracic legs not developed, was taken. It shows several peculiarities due to its very young age, and among these one may be pointed out, viz. that the lower margin of the sixth joint of second legs has only 5 spines; besides it has a spine at the lower distal angle of fourth joint of the same legs, but this feature may be interpreted as variation.

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

Denmark Strait: St. 10: Lat. 64° 24′ N., Long. 28° 50′ W., 788 fm., temp. 3.5°; 1 subadult and 1 very young specimen.

Besides the "Valorous" took the species at the following place.

South of Davis Strait: Lat. 59° 10′ N., Long. 50° 26′ W., 1750 fm.

Distribution. According to the English authors quoted this species was taken by the "Valorous" at two stations situated considerably South of the Denmark Strait, viz.: Lat. 56° 11′ N., Long. 37° 41′ W., 1450 fm., and Lat. 55° 10′ N., Long. 25° 58′ W., 1785 fm.

5. **Apseudes gracillimus** n. sp.

(Pl. I, figs. 4a—4e).

Subadult Female. Body and appendages still more slender than in *A. gracilis*. — Cephalothorax nearly as in that species, but the eye-lobes more produced. The carapace without transverse furrow.

The antennulæ (fig. 4a) as long as the carapace and the two anterior free segments combined; first joint slender, about three times as long as the second, without serration on the inner margin. Outer flagellum 17-jointed, about as long as the peduncle and more than two and a half times as long as the 4-jointed flagellum. — The antennæ almost as long as the antennular peduncles; flagellum 8-jointed; the squama reaches beyond the end of the penultimate joint of the flagellar peduncle.

The chelipeds very slender (fig. 4c) and their joints without spines or serration on the lower (posterior) margin. Second joint is considerably curved, long, only a little shorter than the carpus, five times as long as broad; carpus with the lower margin only somewhat less than twice as long as that of the ischium. Chela four times as long as broad, with the posterior margin very concave; the movable finger twice as long as the front margin of the hand and considerably longer than the fixed finger, which has about 4 setæ along the distal half of its incisive margin but no serration or setigerous area.

Second thoracic segment (fig. 4a) has the first joint of the legs triangular with the front margin nearly transverse and only the terminal angle produced slightly forwards as an acute denticle. The four posterior segments have the lateral processes considerably produced, distally slender, acute, and no produced angles from their proximal part; the processes on the lower surface of the segments conspicuous or even rather long. — Second pair of legs (fig. 4d) slender, second joint with a spine on the lower distal angle; fourth joint conspicuously longer than the sum of the two following joints and with a spine on the lower distal angle; fifth joint about half as long again as broad, slightly longer than the sixth, with a terminal spine above and two spines on the lower margin; sixth joint

in the largest specimen with 7, in somewhat smaller specimens with 6 spines on the lower margin and 2 on the upper; seventh joint with three denticulations below. — Seventh pair of legs (fig. 4e) very slender; second joint about five and a half times as long as broad; sixth joint has on the distal half of the inner margin a row of small spines; seventh joint even slightly longer than the sixth; the claw more than two-thirds as long as seventh joint.

Abdomen (fig. 4b) not quite as long as the sum of the four posterior thoracic segments, very slender. The five anterior segments with conspicuous, slender processes below, and the processes from the postero-lateral angles very short and slender. Sixth segment as long as the three preceding segments combined, even a little more than four times as long as broad at the middle, without tubercles and lateral setæ.

Length of the largest specimens, with the marsupial lamellæ very small, 14 mm.

Remarks. This species differs from *A. gracilis* Norm. & Stebb. in several features of more or less importance. But some characters, viz. the considerably longer inner flagellum of the antennulæ, the extreme slenderness of the chelipeds, no serration or setigerous area on the fixed finger of the chela, finally the oblong fifth joint of second pair of legs show, according to my judgment, that the form must be considered a separate species.

Occurrence. Only taken by the "Thor" at the following locality.

South of Iceland: Lat. 62° 57′ N., Long. 19° 58′ W., 505 fm.; 13 specimens, all mutilated or in fragments.

Sphyrapus Norman, M. S., G. O. Sars.

Five species have been established, three of which are represented in our material.

6. **Sphyrapus anomalus** G. O. Sars.

1869. *Apseudes anomalus* G. O. Sars, Nyt Mag. for Naturv. B. XVI, p. 439.
1881. *Sphyrapus* — — , Arch. for Math. og Naturv. B. 7, p. 19.
1886. — — Norman & Stebbing, Trans. Zool. Soc. London, Vol. XII, Pt. IV, p. 101, Pl. XXI, fig. II.
! 1896. — — G. O. Sars, Account Crust. Norway, Vol. II, p. 9; Pls. III—IV.

This species, which has been excellently figured and described by G. O. Sars, is closely allied to the next form, *S. serratus* G. O. S. The most conspicuous and perhaps also the most valuable difference between them is the shape of the "epimera" of the five anterior abdominal segments; in *S. serratus* these epimera are, seen from above, very outstanding, obliquely triangular, acute but not acuminate, constituting a real saw; in *S. anomalus* they were described by Sars as "not at all produced" and drawn as scarcely or not visible from above, which agrees well with their shape in the males, but often not completely with their shape in the females. In the female from "Ingolf" St. 4 the epimera are visible from above, but much smaller than in *S. serratus*, with the freely outstanding part rather narrow, acuminate and acute, and in several other females the epimera, seen obliquely from above and somewhat from the side, are a little produced, acute, but directed mainly downwards. In all specimens of *S. anomalus* the fifth joint of second pair of legs has only two strong spines on

the distal part of its lower margin, while all adult females of *S. serratus* have three such spines (in a single specimen only two spines on one leg and three on the other); furthermore the basal joint of the antennulæ is a little broader and shorter in *S. anomalus* than in *S. serratus*.

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

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 2 spec.
— — St. 28: Lat. 65° 14′ N., Long. 55° 42′ W., 420 fm., temp. 3.5°; 2 spec.
— — St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; large number of specimens.
West of Iceland: St. 8: Lat. 63° 56′ N., Long. 24° 40′ W., 136 fm., temp. 6.0°; 2 spec.
South-West of Iceland: St. 85: Lat. 63° 21′ N., Long. 25° 21′ W., 170 fm.; 3 spec.
East of Iceland: St. 4: Lat. 64° 07′ N., Long. 11° 12′ W., 237 fm., temp. 2.5°; 1 spec.
North of Iceland: St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 10 spec.
— - — St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 1 young.

Furthermore the species has been taken at East Greenland by two Danish expeditions.

Cape Dalton: Lat. 69° 24.6′ N., ab. Long. 23° 30′ W., 9—11 fm., II[a] Amdrup Exp.; large number of specimens.

Lat. 69° 25′ N., Long. 20° 1′ W., 167 fm., large stones and clay, Ryder Exp.; 1 spec.

Hurry Inlet: Lat. 70° 50′ N., Long. 22° 31′ W., 10 fm., II[a] Amdrup Exp.; 1 specimen.

Lat. 72° 40′ N., Long. 20° 10′ W., 100 fm., Ryder Exp.; 1 spec.

Distribution. *S. anomalus* has been captured by Cand. mag. Ad. Jensen ("Michael Sars") at two places North-East and East of the Shetlands Islands: Lat. 61° 40′ N., Long. 3° 11′ E., 220 fm.; 1 spec., and Lat. 60° 57′ N., Long. 3° 42′ E., 190 fm., temp. 6.1°; 1 spec. The "Thor" has captured it in the Skager Rak in depths from 280 to 350 fm. Sars has taken it "along the whole Norwegian coast from the Christiania Fjord to Vadsö", in depths "from 100 to 400 fathoms". Finally it is known from the Kara Sea, 50 fm. (Hansen) and from the places South of Novaia Zemlia, between Lat. 70° 20′ and 70° 40′ N., Long. 54° 08′ and 56° 35′ East, 61 and 90 meters (Stappers).

According to all these statements *S. anomalus* has been taken a single time in 50 fathoms in the very cold Kara Sea, three times in still lesser depths South of Novaia Zemlia and at numerous places in depths between 100 and 582 fathoms both in the cold area and especially at localities with the temperature somewhat or even considerably above the zero.

7. **Sphyrapus serratus** G. O. Sars.

1881. *Sphyrapus serratus* G. O. Sars, Arch. for Math. og Naturv. B. 7, p. 20.
! 1885. — — — Norske Nordhavs-Exp. Crust. I, p. 66, Pl. XXI.

The differences between this species and *S. anomalus* have been pointed out above.

Occurrence. The "Ingolf" has captured *S. serratus* at five stations, all in the cold deep-sea area.

North of Iceland: St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 1 spec.
— - — St. 125: Lat. 68° 08′ N., Long. 16° 02′ W., 729 fm., temp. ÷ 0.8°; 1 spec.

South of Jan Mayen: St. 119: Lat. 67° 53′ N., Long. 10° 19′ W., 1010 fm., temp. ÷ 1,0°; 4 spec.
— - — St. 117: Lat. 69° 13′ N., Long. 8° 23′ W., 1003 fm., temp. ÷ 1,0°; 4 spec.
— - — St. 113: Lat. 69° 31′ N., Long. 7° 06′ W., 1309 fm., temp. ÷ 1,0°; 4 spec.

Besides this species has been taken by the Norwegian North-Atlantic Expedition at two stations between Norway and Iceland in 1163 fm. and 1215 fm. and the temperatures were ÷ 1.1° and ÷ 1.2°; besides it was taken West of Spitzbergen: Lat. 77° 58′ N., Long. 5° 10′ E., 1333 fm., temp. ÷ 1.4° (Sars).

S. serratus has thus been captured in all nine times, and always in temperatures somewhat or considerably below zero.

8. **Sphyrapus tudes** Norm. & Stebb.[1]).

1886. *Sphyrapus tudes* Norman & Stebbing, Trans. Zool. Soc. London, Vol. XII, Pt. IV, p. 99; Pl. XXII, fig. 1.

This very characteristic species has been well described and figured by the English authors.

Occurrence. *S. tudes* has not been taken by the "Ingolf" but at two localities by the "Thor".
South-West of the Færoes: Lat. 61° 15′ N., Long. 9° 35′ W., 475 fm.; 26 spec.
— - - — Lat. 61° 7′ N., Long. 9° 30′ W., 440 fm.; 22 spec.

Distribution. This species was taken by the "Porcupine" South of Rockall: Lat. 56° 13′ N., Long. 14° 18′ W., 420 fm. (Norman & Stebbing).

Fam. II. Tanaidæ.

This family comprises eighteen genera hitherto established; twelve of these are represented in the "Ingolf" material, and three new genera are established.

Neotanais Beddard.
(*Alaotanais* Norm. & Stebb.).

This genus, which contains some of the largest forms of the family, comprises five species already established. The "Ingolf" collection contains two species, one of which is new, but a third species is enumerated below because it was taken by an English expedition near the entrance of the Davis Strait.

9. **Neotanais serratispinosus** Norm. & Stebb.
(Pl. I, figs. 6a—6b; Pl. II, figs. 1a—1c.).

1886. *Alaotanais serratispinosus* Norman & Stebbing, Trans. Zool. Soc. London, Vol. XII, Pt. IV, p. 111; Pl. XXIII, fig. 1; Pl. XXIV, fig. 1.

[1]) The fourth species of this genus, *Sphyrapus malleolus* Norm. & Stebb., can scarcely be included in this report, as it has not been taken by any Danish expedition, and the most northern among the localities enumerated by the English authors is at Lat. 57° 11′ N., Long. 37° 41′ W., thus South-East of Cape Farewell, but about 12 geographical miles South of the area dealt with in the present paper.

Norman & Stebbing have published a good description and a number of figures of this characteristic species. The single adult specimen at hand, a female with the marsupium fully developed, measures 6.7 mm in length, and is somewhat smaller than the largest specimen seen by the English authors, as they stated it to be 8.5 mm long. My specimens agree well with their description, but I think it useful to give some analytical figures with some remarks.

The chelæ (fig. 6a) are somewhat longer than the carpus, a little more than twice as long as broad, with the posterior margin considerably sinuate, as almost its proximal half is conspicuously concave, the distal half rather convex. The movable finger is somewhat shorter than the front margin of the hand; its incisive margin is armed with six low to extremely low teeth (fig. 6b) increasing much in breadth from the proximal to the penultimate tooth and decreasing much in height from the first to the last tooth; each tooth has its distal end produced into a minute, oblong-triangular, acute tip. The fixed finger has its terminal part bent considerably and shaped as a thick, somewhat spiniform process with the margins glabrous, while the remaining long part of the incisive margin has almost its proximal half furnished with a close row of numerous very small teeth and the distal portion with five large, very broad and proportionately somewhat low, obtuse, brownish teeth.

Fig. 1a represents the terminal part of third left thoracic leg from behind; some nine long, glabrous and strong setæ originate in an oblique row from the margin of sixth joint, which above terminates in three very thick, serrate spines; seventh joint, seen in the intervals between the setæ, is distally slender and three times as long as the straight claw. — Fig. 1b represents the terminal part of sixth left leg from behind, and fig. 1c the corresponding part of seventh left leg from above; the last-named part has a transverse row of spines above the base of the long setæ at the end of sixth joint; in both legs the seventh joint is distally a little flattened and widened towards the rounded end which expands as a roof beyond the insertion of the claw; the distal part of seventh joint is closely serrate along the terminal margin and the most distal portion of the lateral margins, and from this serration to near the middle of the joint each lateral margin has a very close row of minute, very slender spines; the claw is half or more than half as long as seventh joint.

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

South of Greenland: St. 22: Lat. 58° 10′ N., Long. 48° 25′ W., 1845 fm., temp. 1.4°; 3 spec.

Distribution. Norman & Stebbing examined specimens from a station South of Greenland at Lat. 56° 11′ N., Long. 37° 41′ W., 1450 fm., and from two localities respectively North-West of Ireland and West of North Ireland, 1360 and 1380 fm.

10. **Neotanais hastiger** Norm. & Stebb.

1886. *Alaotanais hastiger* Norman & Stebbing, Trans. Zool. Soc. London, Vol. XII, Pt. IV, p. 1103; Pl. XXIII, fig. 2.

Occurrence. This species, which has not been gathered by any Danish expedition and has never been seen by me, is enumerated here because the single specimen hitherto known has been taken by the "Valorous" at a locality not far from the "Ingolf" St. 38 and between this station and Cape Farewell, viz. at Lat. 59° 10′ N., Long. 50° 25′ W., 1750 fm.

11. **Neotanais giganteus** n. sp.

(Pl. II, figs. 2 a—2 h.)

Adult Male. Carapace nearly as long as the three following segments combined, seen from above peculiarly shaped (fig. 2 a), as scarcely its front half has the lateral margins feebly convex and is only a little longer than broad, while the major posterior part is laterally considerably expanded, but the postero-lateral area of this part is subquadrangular, well marked off by a suture and must be considered the coxal joint of the chelipeds. A portion of each lateral margin somewhat behind the front angle is furnished with a close row of outstanding, stiff setæ (fig. 2 b).

The ocular plate is well marked off (fig. 2 c), nearly ovate, with the end subacute and without any vestige of visual elements. — The antennulæ (fig. 2 b) are somewhat longer than the carapace, 7-jointed; the first joint is very long, as long as the other joints combined, seen from above with the inner margin straight, the major proximal part of the outer margin distinctly concave, but the distal part of this margin somewhat convex and bearing a close longitudinal row of horizontal, stiff setæ. Second joint almost as thick, but somewhat less than half as long, as the first, with a shorter row of stiff, horizontal setæ on the outer margin. Third joint is short and rather thick; fourth joint is somewhat shorter than the second, tapers much towards the end and has on the outer side a long row of long sensory hairs; fifth and sixth joints, and especially the last-named, are short, and seventh joint is extremely short. — The antennæ (fig. 2 c) 9-jointed; second, fourth and fifth joints long; third joint a little longer than deep; sixth joint a little shorter and considerably thinner than the fifth; seventh and especially eighth joint somewhat shorter and thinner than the sixth, and ninth joint short and very thin.

The chelipeds (fig. 2 d) are robust. The coxal joint is mentioned above. The basal joint is moderately short but extremely thick, its whole lower side being produced downwards as a long, thick and rounded protuberance. The carpus is long, almost three times as long as deep, and the proximal third of its lower margin is deeply concave. The chela is a little longer than the carpus, two and a half times as long as broad; the movable finger, which is much curved near the middle and somewhat shorter than the strongly convex anterior margin of the hand, has almost the proximal half of its incisive margin serrate and a strong, triangular tooth considerably beyond the middle. The fixed finger has on the incisive margin near its middle a long, straight, subcylindrical, distally rounded process, and near the base a broad protuberance with two small incisions. The fingers cross each other greatly, while a large interval is left between their major proximal part.

The thoracic segments subsimilar in shape, length and breadth (fig. 2 a), excepting the seventh segment which is somewhat shorter; the lateral margins of the segments are very convex. — The legs are moderately slender and somewhat long, all subsimilar, the only exception being that the real claw is extremely short on the anterior pairs (fig. 2 f), a little longer on the posterior pairs (fig. 2 g). Third joint is extremely short, fifth joint a little longer than the fourth, a little shorter than the sixth (fig. 2 e), and the distal half of its lower side is furnished with a number of setæ; sixth joint has the distal half of the lower margin and the end set with a good number of setæ; seventh joint with claw much shorter than sixth joint.

The abdomen as long as the sum of the four preceding segments; its four anterior segments are broader than the thorax; the pleopods are strongly developed. Sixth segment not quite as long

as the two preceding segments combined, somewhat narrower than fifth segment, and posteriorly emarginate. — Uropods (figs. 2 a and 2 h) slightly shorter than the abdomen; peduncle about two and a half times as long as broad; endopod very long with thirteen joints, the first joint conspicuously thicker than the second and third and as long as these two combined; exopod very small, two-jointed, with the proximal joint shorter than the distal.

Length 20 mm.

Remarks. Though new species of this family as a rule ought not to be founded on adult males, I venture to establish a new species on the specimen described, because it is not only characteristic but very much larger than any specimen of Tanaidæ hitherto captured. The animal when hauled up from the sea was quite white.

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

Davis Strait: St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 1 spec.

Heterotanais G. O. S.

Of this genus nine species have been established. The material at hand contains only a single probably new species.

12. **Heterotanais groenlandicus** n. sp.

(Pl. I, figs. 5 a—5 g.)

1887. *Heterotanais limicola* H. J. Hansen, Vidensk. Medd. Naturh. Forening i Kobenhavn for 1887, p. 178 (Probably not *H. (Paratanais) limicola* Harger).

Female. The body (fig. 5 a) about six times as long as broad. — Carapace only a little longer than the two anterior thoracic segments combined, a little longer than broad, anteriorly not fully half as broad as somewhat before the posterior margin (fig. 5 b).

The eye-lobes are considerably produced, distally not angular but rounded (fig. 5 c); the eyes are moderately large, black, but the black pigment renders it impossible to count the ocelli, a couple of which are seen at the hind margin of the black spot. — The antennulæ (figs. 5 a and 5 c) are a little shorter than the carapace, somewhat slender; first joint somewhat longer than the two others combined, almost four times as long as deep; third joint about twice as long as the second. — Antennæ somewhat slender; fourth joint (formed by fusion of fourth and fifth joints) only as long as the two preceding joints combined.

The chelipeds (fig. 5 c) are somewhat robust; the carpus is almost twice as long as deep. The chela is somewhat longer than the carpus and somewhat more than twice as long as broad; the movable finger is much shorter than the hand; the fixed finger (fig. 5 d) is somewhat expanded on the incisive side with about three low protuberances and near the end rather broad and distally rectangular, while the very short apical part of the finger is slender and marked off from the inner expansion.

Second pair of legs (fig. 5 c) with a very long seta from the upper distal angle of fifth joint; sixth joint about as long as fifth and fourth joints combined and a little shorter than seventh joint with claw; seventh joint a little shorter than the claw. Third pair of legs (fig. 5 e) have the seventh

joint and the claw about equal in length and together conspicuously more than half as long as the sixth joint. Seventh pair of legs (fig. 5 f) with the second joint proportionately somewhat slender, four times as long as broad.

Abdomen scarcely or slightly broader than the thorax. — Uropods a little more than half as long as the abdomen; the endopod five-jointed (fig. 5 g), but sometimes the first joint is divided again into two joints by a less conspicuous suture, and the relative length of the joints shows considerable variation; exopod as long as or longer than the first joint of the endopod, two-jointed.

Length of a female with marsupium 2.9 mm.

Remarks. In the above-named paper I had referred specimens of this species to *Heterotanais (Paratanais) limicola* Harger, though, as may be seen in the paper, I was well aware that Harger's description of the eyes did not agree with my specimens. Harger said that "the eyes are small and inconspicuous", while in the specimens seen by me the eyes are of considerable size, black and consequently very conspicuous, and having examined a large number of species of this family I am now inclined to think that the difference mentioned is a specific character. Harger's figures of his *H. limicola*, especially that of the cheliped, are too small for forming a judgement of some particulars. — *H. groenlandicus* differs in several important features from *H. Oerstedii* Kr., in which the eye-lobes are subacute, the third antennular joint not much longer than the second, the carpus and the chela of the chelipeds considerably thicker and the endopod of the uropods only four-jointed.

Occurrence. The "Ingolf" gathered this species at a single locality.

West coast of Greenland: Mouth of Ameralik Fjord, Godthaab (about at Lat. 64° 11′ N.), 5—70 fm., shells; 25 spec.

The Copenhagen Museum possesses specimens from a few places in West Greenland, viz. Proven (Lat. 72° 23′ N., Long. 55° 23′ W.), 1 spec.; Jakobshavn (Lat. 69° 13′ N., Long. 51° 0′ W.), 1 spec. (brought home by Mag. Traustedt); Godthaab, 10 spec. found between numerous specimens of the genus *Metopa* dredged in "deep water" (probably 40—60 fm.) where the bottom was clothed with *Sertularia*.

Distribution. Apart from West Greenland this species has not yet been recorded.

Tanais H. Milne-Edw.

Of this genus seventeen species have been established, but only a single form is known from our northern area.

13. Tanais Cavolinii H. Milne-Edw.

1829.	*Tanais Cavolinii*		H. Milne-Edwards, in Audouin and Milne-Edwards: Précis d'Entomologie, I, Pl. XXIX, fig. 1 (Quoted from Miss Harr. Richardson).
! 1842.	*Tanais tomentosus*		Kröyer, Nat. Tidsskr. B. IV, p. 183.
?	—	—	Kröyer, Voy. en Scand. Crust., Pl 27, fig. 2 a—q.
1847.	—	—	Kröyer, Nat. Tidsskr. Ny R., B. II, p. 412.
! 1896.	—	—	G. O. Sars, Account Crust. Norway, Vol. II, p. 12, Pl. V.

1899. *Tanais Cavolinii* A. M. Norman, Ann. Mag. Nat. Hist. Ser. 7, Vol. III, p. 332.
1905. — — Harr. Richardson, Mon. Isop. North America, Bull. U. S. Nat. Mus. No. 54, p. 8.

The tangled synonymy of this well-known species is found in Norman's and Miss Richardson's papers.

Occurrence. The "Ingolf" secured this species at a single locality.

Færoes: Trangisvaag, between algæ at the shore. Many specimens.

In the paper on the Malacostraca from West Greenland I stated that a specimen with the label: "Greenland, Kröyer's effects", was preserved in the Copenhagen Museum; for this reason I mentioned the species, but did not number it, as I feared that the statement was not quite certain. Nevertheless Norman and other authors have on my authority included "Greenland" in the enumeration of the distribution of the species. But as *T. Cavolinii* has not been found at Iceland and has not in recent time been captured at Greenland I am now nearly sure that the species does not live at the last-named country.

Distribution. This species is known from Öresund (Kröyer), the western coast of Norway northwards to Lat. 63° 20′ N. (G. O. Sars), Scotland northwards ab. to Lat. 56½ N. (Norman), England and Ireland (several authors), the Channel Islands (various authors), West France (Chevreux), many places in the western half of the Mediterranean (several authors), Azores (Barrois); finally Connecticut, Long Island Sound and Castle Harbour, Bermudas (H. Richardson). It lives always in quite shallow water, from the beach down to a few fathoms.

Pseudotanais G. O. S.

Of this genus five valid species have been established; four of these are boreal or arctic, while the fifth species is only known from the Mediterranean. The "Ingolf" captured six species, three of which are new.

This genus differs materially from all other genera by having fifth and sixth thoracic segments very long as compared with the fourth segment and especially with third and second segments. It is placed here because in some other features it is intermediate between *Tanais* and *Paratanais—Typhlotanais*. It agrees with *Tanais* and differs from the other genera in possessing only a single pair of marsupial lamellæ; as to antennulæ, antennæ, uropods and development of second pair of legs as compared with the following pair it agrees on the whole with *Paratanais—Typhlotanais;* as to the mouth-parts — mandibles and maxillipeds — it differs strongly from the genera named and is more related to *Leptognathia*, though showing peculiarities not found in the last-named genus.

14. **Pseudotanais forcipatus** Lilljeborg.
(Pl. II, figs. 3 a—3 e).

1864. *Tanais forcipatus* Lilljeborg, Bidrag till kännedomen om de inom Sverige och Norrige förek. Crust. of .... Tanaidernas familj., p. 16 (Female and Male).
! 1897. *Pseudotanais forcipatus* G. O. Sars, Account Crust. Norw., Vol. II, p. 40; Pl. XVII, fig. 1 (Female and subadult Male).

! 1907. *Pseudotanais forcipatus* Vanhöffen, Zool. Jahrbücher, Abth. für Syst., Bd. XXV, p. 511; Taf. 20, fig. 10—12 (Adult Male).

Female. Sars has published a good description with numerous figures of this sex. To his description may be added that the front margin of the head, seen from above, is shaped as in *P. Lilljeborgii* (comp. fig. 5a), thus nearly transverse, feebly convex at the middle, not emarginate at the antennulæ, and the antero-lateral angles not produced.

The female is readily distinguished from the other northern species, excepting *P. abyssi* n. sp., by the strongly forcipate chelæ; from *P. abyssi* it is separated by having no pleopods, the uropods much shorter, the antennulæ and the walking legs shorter and thicker, etc.

Subadult Male. It has been figured and mentioned by Sars, who erroneously considered it the adult male. It agrees with the female in the shape of the chelæ, the antennulæ, the distal joints of the thoracic legs, etc., but it differs in three features: fourth and fifth thoracic segments shorter, but abdomen proportionately longer and thicker than in the female, and the pleopods well developed with long setæ. — In younger male specimens the thoracic and abdominal segments are more similar to those of the female, while the pleopods are smaller with the setæ short.

Adult Male. Almost fifty years ago Lilljeborg published a brief description in the Swedish language of this sex, but did not figure it, and some five years ago Vanhöffen (l. c.) pointed out the main differences between female and adult male, with three analytical figures of male appendages. A more full description may be given here.

The anterior end of the head about half as broad as the carapace (fig. 3a); the front margin is deeply emarginate at the base of each antennula (fig. 3c) and the antero-lateral angles considerably produced with the end blunt; in a lateral view (fig. 3b) the head is produced forwards covering the base of the outer side of the antennula as a rounded plate.

The antennulæ are seven-jointed (figs. 3b and 3c); the two proximal joints are very thick, subequal in length and together a little longer than the five others combined; third joint broad and a little longer than the two next joints combined; fourth joint very short, with a tuft of sensory hairs on the lower distal angle; the four distal joints increase considerably in length and decrease in thickness from the fourth to the seventh; fifth and sixth joints with some sensory hairs at the outer distal angle; seventh joint considerably longer than the sixth.

The chelæ (fig. 3b) are a little more than twice as long as broad and differ much from those of the female; the fixed finger at the base twice as broad as the movable, but the major distal part of its incisive margin is so concave, that a conspicuous interval is seen between the fingers when their terminal parts cross each other. The movable finger is evenly curved, somewhat longer than the front margin of the hand; the inner surface of the hand has above the insertion of the movable finger a transverse row of about nine peculiar setæ.

Fifth thoracic segment (fig. 3a) a little shorter than the two preceding segments combined and as long as sixth segment. The thoracic legs are conspicuously more slender than in the female. Second pair have the seventh joint with claw longer than sixth joint; third and fourth pairs with the spurs short and simple, while their seventh joint plus claw is only a little shorter than sixth joint; on the three posterior pairs (fig. 3d) seventh joint together with its claw is much longer

than in the female, about as long as the sixth joint, and the claw is conspicuously longer than seventh joint.

Abdomen much larger in proportion to the thorax than in the female, as long as the sum of the four posterior thoracic segments; sixth segment (fig. 3 e) produced considerably backwards, much longer than in the female and with the hind margin deeply emarginate, while the postero-lateral angles are scarcely rounded. — Pleopods about as in the female *P. abyssi*, with moderately narrow rami and the setæ very long. — Uropods (fig. 3 e) in the main as in the female, but a little more slender, and one of the terminal setæ of the endopod extremely long.

Length of two males 1.25 and 1.40 mm.

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

West Greenland: Inner end of Ameralik Fjord, Godthaab, muddy bottom; 43 specimens, 2 of which are adult males.

North of Iceland: St. 128: Lat. 66° 50′ N., Long. 20° 2′ W., 194 fm., temp. 0.6°; 4 spec.

P. forcipatus has besides been captured by other collectors at the following five localities within our area.

West Greenland: Karajok Fjord, ab. Lat. 70° 20′ N.; many spec. Vanhöffen.

East Iceland: Faskrud Fjord, 20—50 fm.; 1 spec. Mag. sc. R. Horring.

East Greenland: Cape Dalton, Lat. 69° 24′ N., 9—11 fm.; 5 spec. (♀ and ♂). II[d] Amdrup Exp.

- — Turner Sound, Lat. 69° 44′ N., 3 fm.; 8 spec. II[d] Amdrup Exp.

- — Denmark Isl., Lat. 70° 27′ N., Long. 26° 12′ W., 10 fm., clay; 2 spec. Ryder Exp.

- — — - several spec. Ryder Exp.

Distribution. This species has been established on specimens taken off Bohuslän in 50—60 and 120—130 fm. In the Danish seas it has been taken four times, viz. two times in the south-western Kattegat, 13 and 15 fm., and two times in Skager Rak, in 70 and 125 fm. (H. J. Hansen). According to Sars it has been found along the whole Norwegian coast northwards about to Lat. 70° N. Furthermore it was captured in Klosterelv Fjord, East Finmark, close upon the frontiers of Russia (A. M. Norman), in the Barents Sea at Lat. 76° 26′ N., Long. 60° 55′ N., vertical pelagic haul from 30 to 0 meter (Stappers) and at Northbrook Island, Franz Joseph Land, 10 fm. (Th. Scott). Finally it is known from some localities in the northern Scotland, in 8—10 and 50—55 fm. (Th. Scott).

This species is thus boreal and arctic and lives in very moderate depths, from some few fathoms and down to nearly 200 fathoms.

15. **Pseudotanais abyssi** n. sp.

(Pl. II, figs. 4a—4i.)

Female. The body of the females with marsupium (fig. 4a) somewhat more than three times as long as broad; in the immature female it is conspicuously more slender. — Carapace, seen from above, with the lateral margins considerably convex excepting near the front end and two and a half times as broad as this front end; the anterior margin feebly concave behind the antennulæ, feebly produced at the middle and at the lateral angles. — Eyes wanting.

The antennulæ (figs. 4 a and 4 c) as long as the carapace, the second segment and half of the

third segment combined, rather slender. First joint, seen from the side, not fully five times as long as deep, decreasing conspicuously in depth from the base towards the middle and somewhat longer than the two other joints combined; third joint only a little longer than the second. — Antennæ (fig. 4 c) moderately slender; second and third joints without any spine at the distal upper angle; fourth joint (in reality formed by a fusion of fourth and fifth joints) two and a half times as long as the penultimate joint.

Chelipeds (fig. 4 d) somewhat slender. Carpus conspicuously longer than the basal joint, two and a half times as long as deep. Chela much longer than the carpus, nearly two and a half times as long as broad, with the posterior margin feebly concave; the fixed finger only slightly broader than the proximal part of the movable and keeping the same breadth from near the base to the middle; the movable finger is conspicuously longer than the front margin of the hand, moderately slender, with the major part of its incisive margin almost convex, at the base far from touching the fixed finger, so that the fingers, when their distal parts are crossed, are very forcipate, leaving a considerable triangular interval between their proximal halves.

Fifth thoracic segment (fig. 4b) as long as the sum of the three preceding segments and scarcely or slightly longer than the sixth segment. — The thoracic legs are slender and somewhat long. Second pair (fig. 4 e) with sixth joint a little shorter than fourth and fifth joints combined (the articulation between these two joints forgotten on the figure) and almost half as long again as seventh joint with claw, and seventh joint itself is much shorter than the claw. Third pair (fig. 4 f) with the sixth joint not quite half as long again as the fifth and twice as long as seventh joint with claw; seventh joint and claw equal in length; spur on fifth joint moderately slender, not expanded; considerably less than half as long as sixth joint. Three posterior pairs of legs (fig. 4 g) with second joint long and slender, sixth joint a little longer than the fifth, seventh joint rather short, claw extremely short; the spur slender and only about as long as the diameter of the joint.

The abdomen somewhat longer than the sum of the two preceding segments (fig. 4 a). Pleopods well developed; their rami with very long setæ (fig. 4 h). — Uropods somewhat long (fig. 4 i); endopod with the proximal joint a little longer than the distal; exopod slender, reaching a little or somewhat beyond the end of the first joint of the endopod, and its two very distinct joints subequal in length.

Length of a female with the marsupium half developed 1.17^{mm}.

Remarks. This small species agrees with *P. forcipatus* in having no eyes and the chelæ strongly forcipate, but it differs from it in several features, especially in possessing well developed pleopods with long setæ, longer uropods, longer and more slender chelipeds and legs. *P. abyssi* bears some resemblance to *P. oculatus* n. sp., but the latter differs in having distinct ocelli, the chelæ conspicuously less forcipate, the exopod of the uropods longer and in several particulars in the legs. From the other northern species of the genus *P. abyssi* differs greatly, above all in having the chelæ strongly forcipate.

Occurrence. The "Ingolf" secured this species at a single station.

Davis Strait: St. 36: Lat. 61° 50′ N.. Long. 56° 21′ W., 1435 fm., temp. 1.5°; 3 spec. (2 are females with the marsupium half developed).

16. **Pseudotanais Lilljeborgii** G. O. Sars.
(Pl. II, figs. 5a—5g.)

1881. Pseudotanais Lilljeborgii G. O. Sars, Arch. for Math. og Naturv. B. 7, p. 48.
! 1897. — Lilljeborgi — Account Crust. Norw., Vol. II, p. 40; Pl. XVII, fig. 2.

Female. Sars has described and figured the female, while he has not seen any immature or adult male. But his representation of the front end of the head with the eyes is not quite correct. My fig. 5a represents the outline of the carapace with the right antennula; it is seen that the carapace is about two and a half times as broad as its front margin, which is transverse and a little convex at the middle. Sars mentioned the eyes and figured them as black spots, but while these spots frequently are distinct in specimens preserved during some years in spirit, I was unable to find them in specimens from several of the deeper "Ingolf" stations. Furthermore, internal visual elements of an ocellus or some two to three ocelli seem sometimes but not always to be distinguishable, but I have been unable to detect any cornea, so that the eyes must be considered quite rudimentary.

The female is well distinguished from the other species by a combination of characters, among which the most important may be enumerated. Third antennular joint is only slightly longer than the second; the chela is from two and a half to three times as long as broad, not forcipate; the legs are robust, the spurs of third to seventh pairs very broad and short or very short; the pleopods are wanting, and the uropods are short, with the two-jointed exopod not quite as long as the proximal joint of the rather stout endopod. — The length 1.55—2.05 mm.

Immature Male. Agrees with the female excepting as to the abdomen, which is stronger and proportionately somewhat or considerably longer than in that sex; furthermore the pleopods are less or more developed according to age. In a younger male the pleopods are rather short with their setæ quite short. In a subadult specimen the pleopods are very well developed, conspicuously longer than the uropods, with their rami very oblong and some of the setæ longer than the rami. In the last-named specimen the third antennular joint is a little thickened below; finally fig. 5g represents the distal part of seventh leg, which agrees with that of the female in the following important particulars: the spur (on fifth joint) is very short and broad; the seventh joint, which is somewhat thick, is only one-third as long as sixth joint; the claw is thick and short.

Adult Male. Somewhat similar to the male of *P. forcipatus,* but differs in several particulars. In the relative length of the thoracic segments as compared with each other and in the strong development of abdomen it agrees with the male of *P. forcipatus* and differs consequently much from the female.

The front margin of the head (fig. 5b) between the outer angles of the antennular peduncles is considerably convex; at the outer base of each antennula the lateral part of the head (fig. 5c) is a somewhat high, flatly rounded lobe which, seen from above (fig. 5b), is very conspicuous and marked off by an oblique suture forming the continuation of the median part of the front margin; this antero-lateral small part of the head is thus above, but not on the side, marked off as an eye-lobe, but a real eye could not be discovered. — The seven-jointed antennulæ (figs. 5b and 5c) are rather similar to those of the male *P. forcipatus,* but the two proximal joints are less robust and the seventh joint not longer than the sixth.

The chelæ (fig. 5 c) are somewhat less than three times as long as broad, with the posterior margin very moderately concave, shaped in the main as in the female, but the fingers are conspicuously shorter in proportion to the hand; the movable finger is thicker and the fixed finger near the base less thick than in the male *P. forcipatus*.

The thoracic legs as in the male *P. forcipatus* conspicuously more slender than in the female and as in that species showing other differences, but besides affording specific characters. Second pair (fig. 5 c) with seventh joint plus claw more than half as long again as sixth joint. Third and fourth pairs with the short spur rather slender, while seventh joint with claw is as long as sixth joint. Three posterior pairs of legs (figs. 5 e and 5 f) with the spur short and rather slender; seventh joint with claw only a little shorter than sixth joint, and the claw itself only half as long as seventh joint.

The five anterior abdominal segments, seen from above (fig. 5 d), with the lateral margins of each segment very convex, so that the entire lateral margin of this part of the abdomen has five deep incisions, while in the male *P. forcipatus* this margin shows no such incisions. Sixth segment posteriorly somewhat produced, but much less than in *P. forcipatus,* and has at the middle of the hind margin a somewhat small, angular emargination. — The highly developed pleopods with some of the setæ more than twice as long the rami. — The uropods in the main similar to those in the female, but the rami a little longer.

Length of the single male 1.8 mm.

Occurrence. The "Ingolf" has captured this species at seven localities.

West Iceland: St. 86: Lat. 65° 03′ N., Long. 23° 47.6′ W., 76 fm.; 1 spec.

East of Iceland: St. 4: Lat. 64° 07′ N., Long. 11° 12′ W., 237 fm., temp. 2.5°; 3 spec.

- - — St. 58: Lat. 64° 25′ N., Long. 12° 09′ W., 211 fm., temp. 0.8°; 14 spec.

East Iceland: Seydis Fjord, 20—50 fm.; 5 spec.

North of Iceland: St. 128: Lat. 66° 30′ N., Long. 20° 02′ W., 194 fm., temp. 0.6°; 4 spec.

- - — St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 5 spec.

Jan Mayen: St. 115: Lat. 70° 50′ N., Long. 8° 29′ W., 86 fm., temp. 0.1°; 10 spec.

P. Lilljeborgii has besides been taken by other expeditions at six localities situated in very different parts of our area.

West Greenland: Karajok Fjord, ab. Lat. 70° 20′ N.; several spec. Vanhöffen.

East Iceland: Nord Fjord, 40 fm.; 5 spec. Mag. sc. R. Horring.

East Greenland: Angmasivik, at Lat. 65° 51′ N.; 1 spec. Mag. sc. Kruuse.

- — Cape Dalton, Lat. 69° 24′ N., 9—11 fm; 2 spec. (♀ and adult ♂). II[d] Amdrup Exp.

- — Denmark Isl, Lat. 70° 27′ N., Long. 26° 12′ W. 4—5 fm., muddy bottom; 1 spec. Ryder Exp.

- — — - 1 spec. Ryder Exp.

Jan Mayen: 55 fm.; 1 spec. II[d] Amdrup Exp.

Distribution. Outside our area hitherto known from Varanger Fjord at Vadso (ab. Lat. 70° 10′ N. in East Finmark), "in a depth of 100—120 fathoms" (G. O. Sars); recently it has been taken in the Barents Sea, Lat. 76° 26′ N., Long. 60° 55′ E., vertical pelagic haul from 30 to 0 meters (Stappers).

P. Lilljeborgii is thus more arctic than *P. forcipatus;* at the very cold places in the northern East Greenland it was found in quite low water, while in the open sea off Iceland it was most frequently found in depths from about 200 to near 300 fm.

17. **Pseudotanais oculatus** n. sp.

(Pl. II, figs. 6a—6d; Pl. III, figs. 1a—1d.)

Female (with the marsupium half developed, and younger specimens). Body four times as long as broad. — Carapace, seen from above (fig. 1a), with the lateral margins somewhat convex excepting near the front end, anteriorly half as broad as somewhat from the hind margin; the front margin is considerably bent, forming an angle at the middle, and the antero-lateral angle is produced, but seen from the side (fig. 1c) this produced part is not rounded but angular at the upper base of the antennæ. — The eyes are well developed, rather large, with about seven ocelli, and the cornea of each ocellus very conspicuous; in recently captured specimens the eyes are black and in a couple of specimens the dark colour has been preserved during many years.

Antennulæ about as long as the carapace plus second and half of the third thoracic segment, somewhat slender. First joint, seen from the side (fig. 1c), about four times as long as deep and with the proximal part much deeper than the middle part; this joint is somewhat longer than the two other joints combined, and third joint is somewhat longer than the second. — Antennæ somewhat robust; second and third joints proportionately long, without any real spine at the distal upper angle; third joint a little less than half as long as the fourth, which is a little less than twice as long as the penultimate joint.

Chelipeds (figs. 1b and 6a) moderately slender. Carpus somewhat less than twice as long as deep. Chela three times as long as broad (fig. 6a), with the posterior margin considerably concave; fixed finger somewhat narrow near the base, yet considerably thicker than the movable finger, slightly decreasing in breadth from near the base to somewhat beyond the middle and with most of the incisive margin straight; movable finger somewhat shorter than the anterior margin of the hand, rather narrow, towards the base not touching the other finger, and when the distal parts of the fingers are crossed, a conspicuous interval is left between their more proximal parts, but especially at the base this interval is a good deal narrower than in *P. abyssi* or *P. forcipatus.*

Fifth thoracic segment a little shorter than the three preceding segments combined and as long as the sixth. — The thoracic legs of moderate length and thickness (fig. 1b). Second pair (fig. 6b) with the sixth joint elongate, even slightly longer than fifth and fourth joints combined, much tapering towards the end and almost half as long again as seventh joint with claw. Third pair with the sixth joint about as long as the fifth plus half of the fourth and not fully twice as long as seventh joint with claw; the spur on fifth joint half as long as sixth joint, broad at the base but near the base somewhat abruptly much thinner and then tapering to the acute end. Fourth pair (fig. 6c) in the main as the third, but fifth to seventh joint somewhat shorter and the short basal part of the acute spur is very broad. Seventh pair (fig. 6d) with sixth joint slightly longer than the fifth and twice as long as seventh with claw; the spur somewhat slender.

The abdomen somewhat longer than the two posterior thoracic segments combined. Pleopods well developed, with long setæ. — Uropods (fig. 1 d) with very long terminal setæ; endopod somewhat robust with the proximal joint slightly longer than the distal; exopod only a little shorter than the endopod but considerably thinner, with the proximal joint slightly shorter than the distal.

Length of a female with the marsupial lamellæ less than half developed 1.9 mm.

Remarks. *P. oculatus* differs from *P. forcipatus* and *P. Lilljeborgii* by possessing well developed pleopods, the exopod of the uropods much longer than the proximal joint of the endopod, etc.; it differs from *P. abyssi* in the chelæ, shorter and proportionately thicker legs, longer exopod of the uropods, etc., from *P. affinis* by features in nearly all appendages. It is on the whole more allied to *P. mediterraneus* G. O. S. than to any species described in the present paper, but differs from it in having the claw of second pair of legs shorter and in various minor features in the antennæ and thoracic legs. And above all it differs from *P. mediterraneus* and all species described from Norway or in the present paper in possessing real eyes with several well developed corneæ.

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

Davis Strait: St. 34: Lat. 65° 17′ N., Long. 54° 17′ W., 55 fm.; 1 spec.

Besides it has been captured at West and East Greenland by three other collectors.

West Greenland: Upernivik, Lat. 72° 48′ N., July 21, 1887; 1 spec. Ryder.

Davis Strait: Lat. 65° 27′ N., Long. 54° 45′ W., 67 fm., temp. 1.1°; 1 spec. Wandel.

East Greenland: Angmagsalik, ab. Lat. 65° 30′ N. Aug. 7, 1902; 1 spec. Mag. sc. Kruuse.

18. **Pseudotanais affinis** H. J. Hansen.

(Pl. III, figs. 2a—2o, and? figs. 3a—3b.)

1886. *Pseudotanais affinis* H. J. Hansen, Dijmphna-Togtets zool.-bot. Udbytte, p. 207; Tab. XXI, Fig. 2 (Female).

— — *crassicornis* H. J. Hansen, l. c. p. 208; Tab. XXI, Fig. 3, 3a (Subadult Male).

Female. The body about five times as long as broad. — Front margin of the head only about one-third as long as the breadth of the carapace (fig. 2a), somewhat sinuate, being conspicuously convex at the middle, a little emarginate behind each antennula and with the lateral angles distinctly produced. No eyes.

The antennulæ are moderately long, somewhat more than half as long again as the carapace (fig. 2a). First joint, seen from the side (figs. 2b and 2d), with the basal fourth considerably expanded below, four and a half to five times as long as deep, at the base broader than deep and seen from above (fig. 2a) abruptly narrowed slightly beyond the middle. Second joint about three times as long as deep; third joint slender, from a little longer to one-third as long again as the second. — Antennæ moderately slender; second and third joints (fig. 2d) on the distal upper angle with a spiniform, strong process; fourth joint nearly two and a half times as long as the penultimate.

Chelipeds rather slender. Chela (fig. 2e) more slender than in the preceding species, from a little more than three times to more than three and a half times as long as broad, with the posterior margin considerably concave at the middle; the fixed finger moderately slender and tapering from

the base; the movable finger nearly as long as the front margin of the hand, conspicuously more slender than the fixed finger; when the distal parts of the fingers are crossed there is a narrow or no interval between their proximal halves.

Fifth thoracic segment about three-fourths as long as the three preceding segments combined and scarcely longer than the sixth segment. — Thoracic legs moderately long and rather slender, but the posterior pairs vary a little in this respect. Second pair (fig. 2 f) with sixth joint almost as long as fifth and fourth joints combined and a little shorter than seventh joint with claw. Third pair (fig. 2 g) with the sixth joint only a little longer than the fifth and not fully twice as long as seventh joint with claw; the spur on fifth joint about, or more than, half as long as sixth joint, strongly narrowed a little beyond the very broad base (fig. 2 i) and with the distal half conspicuously expanded, forming a very oblong plate with the end subacute or narrowly rounded. Seventh pair (fig. 2 h) with fifth joint somewhat longer than the sixth, which is not fully twice as long as seventh joint with claw; the spur not half as long as sixth joint, moderately narrow or somewhat thin, not expanded at the middle.

Abdomen almost as long at the two preceding thoracic segments combined. — Pleopods well developed; the longest setæ about three times as long as their rami and on the posterior pairs even reaching the end of the uropods. — Uropods (fig. 2 c) somewhat long and slender; the endopod with the proximal joint slightly longer than the distal; the exopod reaches about the middle of the distal joint of the endopod, and its proximal joint is always considerably shorter than the distal.

Length of the largest female with marsupium (from the Kara Sea) 2.2 mm, of large specimens without marsupium 2.1 mm.

Subadult Male. The most characteristic difference between subadult males and the other sex are the antennulæ (fig. 2 l), which have the first joint much thicker, the second somewhat to much thicker, than in the other sex; the third joint is slender with a thickening below at the base. Fifth and sixth thoracic segments somewhat shorter as compared with the three anterior segments than in the females. The chelæ (fig. 2 m) and the thoracic legs (fig. 2 o) vary conspicuously as to thickness. Pleopods and uropods as in the females.

Variety. At Stat. 25 the "Ingolf" captured a number of specimens, all immature and of both sexes, which in some particulars differ from the other material. The largest female is only 1.4 mm, the largest subadult male 1.3 mm. In the females the antennulæ (fig. 2 k) are distinctly less slender than usual, with first joint about four times as long as deep; the antennæ are conspicuously thicker (fig. 2 k) with the fourth joint only twice as long as the penultimate, while second and third joints have a slender spine instead of a stronger process on their upper distal angle. The chelæ about three times as long as broad; the thoracic legs on the whole a little more robust and the spur on third pair scarcely as long as and somewhat more spiniform than in the typical form. The uropods normal. — In the subadult male the antennulæ (fig. 2 n) have first and second joints much thickened, but the third joint is more than half as long again as the second, the thickening is not confined to the short proximal part but reaches to near the middle of the joint, and the proximal half of the joint is distinctly conical, the distal half cylindrical. The antennæ nearly as in the female, with the fourth joint slightly thicker.

The main differences between this variety and the normal form are thus the slender spines instead of processes on second and third joints of the antennæ, the shape of the proximal half of third antennular joint in the male, and the fact that the appendages of both head and thorax are on the whole more robust. But I think it improbable that these differences are of specific value; adult females with marsupium ought at least to be procured before the variety may possibly be separated as a new species.

Remarks. I established *P. affinis* on 3 females from the Kara Sea, while the insufficiency of the literature on the genus and my very scanty material induced me to establish *P. crassicornis* on a subadult male. I find it useful to insert here a more detailed description of female and subadult male together with a number of figures, as I now possess a rich material both of this species and of other forms.

P. affinis is closely allied to *P. macrocheles* G. O. Sars, but if the figures published by Sars (1897) are correct, the latter species differs especially in the outer ramus of the uropod, which is shorter and showing a proportion between its joints quite different from the features found in *P. affinis;* besides Sars has figured the antennulæ with a strong seta, while a process is found in the typical specimens of *P. affinis*. Sars' figures of the legs differ also in minor particulars from *P. affinis*.

Adult Male (Pl. III, figs. 3a—3b). A single adult male has been taken (at "Ingolf" St. 124) together with two females. But though this specimen considerably resembles the male of *P. forcipatus*, I am not quite sure that it belongs to *P. affinis*. The head, seen from the side (fig. 3a), has the antero-lateral lobe still longer than in *P. forcipatus*, broadly rounded. — The antennulæ have the fifth joint slightly shorter than the sixth, which is scarcely as long as the seventh. — The antennæ thicker than in the female; third joint proportionately long, as long as the penultimate joint, with a rather long spine on the distal upper angle. — The chelæ shaped as in the male *P. forcipatus*, somewhat more than twice as long as broad; the fixed finger at the base more than twice as broad as the movable, which is somewhat shorter than the front margin of the hand; a narrow interval is seen between the subdistal portions of the fingers.

Second pair of legs (fig. 3a) with the sixth joint a little shorter than the two preceding joints combined, but as long as seventh joint with claw. Fourth pair of legs uncommonly short, only two-thirds as long as the sixth pair; fifth pair, which are poorly preserved, seem also to be somewhat short. The three posterior pairs have the sixth joint a little shorter than seventh joint with claw.

The abdomen as to the shape of the lateral margins (fig. 3b) and other particulars nearly as in *P. forcipatus*, but sixth segment is proportionately longer and more produced backwards, reaching slightly beyond the end of first joint of the endopod of the uropods, while the posterior margin is somewhat broad and deeply emarginate as in *P. forcipatus*. — The uropods differ much from those of the female; the endopod has the proximal joint much longer than the distal, the exopod reaches slightly beyond the proximal joint of the endopod and its first joint is somewhat longer than the second.

Length of the single male 1.36 mm.

The shape of the chelæ and especially the relative length of the joints in the uropods as compared with the corresponding organs of the female *P. affinis* make the reference of the adult male to

this species somewhat uncertain, though, on the other hand, the antennulæ, the chelæ, the second pair of legs and the shape of the last abdominal segment show close relationship to the above-described males of the two other species of this genus, and no other species of the genus is known to which the male might possibly belong. For these reasons I have described and figured this male and referred it, with a query, to *P. affinis*.

Occurrence. The "Ingolf" has captured this species at twelve stations.

Davis Strait:	St. 32: Lat. 66° 35′ N.,	Long. 56° 38′ W.,	318 fm.,	temp. 3.9°;	3 spec.
—	St. 25: Lat. 63° 30′ N.,	Long. 54° 25′ W.,	582 fm.,	temp. 3.3°;	13 spec., described above as a variety.
—	St. 24: Lat. 63° 06′ N.,	Long. 56° 00′ W.,	1199 fm.,	temp. 2.4°;	3 spec.
South-West of Iceland:	St. 78: Lat. 60° 37′ N.,	Long. 27° 52′ W.,	799 fm.,	temp. 4.5°;	1 spec.
North-West of the Færoes:	St. 138: Lat. 63° 26′ N.,	Long. 7° 56′ W.,	471 fm.,	temp. ÷ 0.6°;	4 spec.
— - - —	St. 139: Lat. 63° 36′ N.,	Long. 7° 30′ W.,	702 fm.,	temp. ÷ 0.6°;	1 spec.
East of Iceland:	St. 103: Lat. 66° 23′ N.,	Long. 8° 52′ W.,	579 fm.,	temp. ÷ 0.6°;	3 spec.
— - —	St. 102: Lat. 66° 23′ N.,	Long. 10° 26′ W.,	750 fm.,	temp. ÷ 0.9°;	1 spec.
— - —	St. 101: Lat. 66° 23′ N.,	Long. 12° 05′ W.,	537 fm.,	temp. ÷ 0.7°;	3 spec.
North of Iceland:	St. 124: Lat. 67° 40′ N.,	Long. 15° 40′ W.,	495 fm.,	temp. ÷ 0.6°;	3 spec.
North-East of Iceland:	St. 119: Lat. 67° 53′ N.,	Long. 10° 19′ W.,	1010 fm.,	temp. ÷ 1.0°;	6 spec.
South of Jan Mayen:	St. 116: Lat. 70° 05′ N.,	Long. 8° 26′ W.,	371 fm.,	temp. ÷ 0.4°;	1 spec.

Besides the species has been secured by the II[d] Amdrup Exped. at a single locality.

East Greenland: Forsblad Fjord, at Lat. 72° 27′ N., Long. 25° 28′ W., 50—90 fm.; 1 spec.

Distribution. The type specimens were taken in the Kara Sea, 64—65 fm. (H. J. Hansen). — According to the list of localities the species has been taken four times in the warm area in depths from 318 to near 1200 fm., and the highest temperature is 4.5°, but besides it is widely distributed in the cold area in depths from 371 to 1010 fm. and the lowest temperature was ÷ 1.0°; finally it has been captured at cold localities in the northern East Greenland and the Kara Sea in much lesser depths, viz. between 50 and 90 fm.

19. **Pseudotanais longipes** n. sp.

(Pl. III, figs. 4a—4i.)

Female. The body scarcely four times as long as broad. — Carapace strongly tapering in breadth forwards (fig. 4b), with the lateral margins not much convex; the anterior margin, which is even a little less than one-third as long as the breadth of the carapace somewhat before its hind margin, is feebly concave at each antennula. — Eyes wanting.

Antennulæ very elongate, twice as long as the carapace (fig. 4a) and extremely slender (fig. 4c). First joint more than six times as long as deep though its proximal part is somewhat thickened below, slightly longer than the two other joints combined; second joint not half as long as the third; the setæ on all joints extremely long. — The antennæ (fig. 4c) are very slender; third joint shorter

than deep and much shorter than the second; fourth joint extremely long, almost four times as long as the penultimate joint, which is conspicuously longer than second and third joints combined.

Chelipeds somewhat long and slender (fig. 4a). Carpus twice as long as the basal joint and three times as long as deep. Chela a little less than half as long again as the carpus, four and a half times as long as broad (fig. 4d); the fixed finger at the base somewhat broader than the movable and keeping almost the same breadth to beyond the middle; the movable finger slender, tapering from near the base to the end, and the fingers without any interval between them when their terminal parts cross each other.

Fifth thoracic segment slightly longer than the three preceding segments combined, or than the sixth segment. — The legs extremely long and very slender; second pair with the sixth joint, though very long, scarcely as long as the sum of the two preceding joints but somewhat longer than seventh joint with claw, and the claw almost twice as long as seventh joint. Third pair (fig. 4f) with the sixth joint slightly shorter than the fifth and slightly longer than seventh joint with claw; the spur on fifth joint is a very long, slender spine. Fourth pair in the main as the third pair; the spur on fifth joint is a slender spine more than two-thirds as long as the sixth joint (fig. 4g) which is considerably longer than seventh joint with claw. — Seventh pair (fig. 4h) with the sixth joint slightly longer than the fifth and about two and a half times as long as seventh joint with claw.

Abdomen slightly longer than seventh, sixth and half of the fifth thoracic segment combined. Pleopods with slender rami and long setæ. — Uropods long and very slender (fig. 4i); the endopod with the proximal joint somewhat longer than the distal; the exopod reaches a little beyond the middle of the distal joint of the endopod, but its division into two joints could not be perceived with certainty; one of the terminal setæ of the exopod is nearly three times as long as the ramus itself and a little longer than the longest terminal seta of the endopod.

Length of the immature female drawn (the marsupial lamellæ are small) 1.60^{mm}; another female without marsupium measures 1.95^{mm}.

Remarks. *P. longipes* is easily distinguished from all other species of the genus by its extremely long and slender antennulæ, legs and uropods and the long and narrow chelæ.

It was taken at the station, where the trawl was filled with an enormous quantity of sponges, and it is of interest to note, that *Typhlotanais eximius* n. sp., which possesses chelæ more narrow and longer than any other species of the genus, and besides a most curious, extremely long-legged species of the sub-order Asellola have been taken at the same station. Judging from these facts I am inclined to suppose that such long-legged species have been developed under the influence of the environment, the sponges, and have been adapted to live on that peculiar ground.

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

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 3 spec.

Paratanais Dana.

This genus comprises at present nine species, but only a single form is known from the area investigated.

20. **Paratanais Batei** G. O. Sars.

1884. *Paratanais Batei* G. O. Sars, Arch. for Math. og Naturv. B. 7, p. 32.

! 1896. — — — Account Crust. Norw. Vol. II, p. 16, Pl. VII.

Occurrence. This well-known species has not been taken by the "Ingolf", but by two travelling Zoologists.

South of Iceland: Vestmannaeyjar, the littoral belt, Aug. 21, 1899; 1 spec. Mag. B. Sæmundsen.

The Færoes: Vestmannhavn, 10—30 fm., June 2, 1899; 1 spec. Dr. Th. Mortensen.

Distribution. *P. Batei* has been taken "in several places on the west coast of Norway, in comparatively shallow water among the roots of Laminariæ" (G. O. Sars). Furthermore it is known from some places on both sides of Scotland (T. Scott), from Falmouth and Plymouth (A. M. Norman), Galway Bay in Ireland, 5—15 fm. (Tattersall), the Channel Islands (various authors), Saint-Jan-de-Luz in S. W. France, $2^1/_2$ fm. (Dollfus), finally from the Mediterranean at Spezia, 6—10 fm. (G. O. Sars) and the Gulf of Naples, $1—1^1/_2$ fm. (G. Smith).

P. Batei is decidedly a shallow water species, and its occurrence near South Iceland is of interest, as some other Crustacea from the Lusitanican area also occur there and have their limit of distribution in north-western direction at that coast.

Typhlotanais G. O. Sars.

This genus hitherto comprised sixteen species, of which nine are known from Norway. The "Ingolf" material comprises nineteen species, but sixteen of these are new, while three are dealt with in the work of Sars. The sixteen new species were all taken in depths ranging from 293 to 1870 fathoms, and the majority exclusively in depths from 690 to 1870 fathoms, but even eleven of these species were captured only at a single station and seven among them I establish on a single specimen. Judging from these facts I am tolerably sure that several and probably numerous species of this genus living in the area explored by the "Ingolf" are still undiscovered, furthermore that the depths of the oceans, from about 400 to at least 2000 fathoms, must contain a very large number of species of this genus.

Sars has published a good description of the genus according to the species seen by him. But some of my new species differ conspicuously from that description in a few points. Thus, some species have the lateral margins of the thoracic segments very angular, while Sars said that the lateral contours of the body are almost straight; *T. macrocephala* has the cephalothorax extremely large, the antennulæ much thicker and the chelæ broader than allowable according to Sars' diagnosis. But I have found it impossible not only to separate a single form or some species as a new genus, but even to divide my nineteen species into moderately well separated groups, because the characters are intermingled in such a way and so gradually developed in various species, that no natural division of any value could be discovered.

The scantiness of my material of the majority of the new species rendered it impossible to examine their mouth-parts. But I have examined these parts of one of the species most aberrant from the forms studied by Sars, viz. *T. irregularis* n. sp., and found that they differed so little from

the figures published by Sars that the only feature worth mentioning is, that the movable lobe on the left mandible is very large, being a little longer and probably broader than the incisive lobe. Consequently, I suppose that Sars' description and figures in all points of any importance hold good for all species described in the following pages.

The genus *Typhlotanais* (females and immature males) may be characterized by the following diagnosis. Eyes wanting. Antennulæ three-jointed; first joint at least as long as and generally longer than the two other joints combined, second joint proportionately short. Antennæ with fourth and fifth joints completely fused, without any suture between them. Mandibles well developed with their molar process cylindrical or even a little thicker at the obliquely cut, dentate end. Chelæ slender, at least two and a half times as long as broad. Second pair of legs differ conspicuously from third or fourth pair by having seventh joint with claw considerably longer. Pleopods well developed in the female. Uropods with the rami slender, two-jointed or one-jointed. Incubatory pouch consists of four pairs of lamellæ. — (Adult males of all species unknown excepting of *T. finmarchicus* G. O. S., which has been described by Sars).

21. **Typhlotanais irregularis** n. sp.

(Pl. III, figs. 5a—5e.)

Female. Body moderately robust, somewhat more than five times as long as broad. — Carapace somewhat or considerably shorter than the two next segments combined, a little longer than broad, with the lateral margins somewhat convex, the front margin two-thirds as long as the posterior and the median process moderately long, acute.

Antennulæ (figs. 5a and 5b) considerably shorter than the carapace, rather stout. First joint considerably longer than the two other joints combined, not fully two and a half times as long as deep and tapering considerably and gradually from a little from the base to the end; second joint scarcely as deep as long and about half as long as the third; the longest terminal seta scarcely as long as third and second joints combined. — Antennæ moderately robust; third joint not thickened; fourth considerably less than twice as long as the penultimate joint; terminal setæ scarcely as long as those of the antennulæ.

Chelipeds (fig. 5b) moderately strong. Basal joint with the proximal protuberance somewhat short; the distance between its posterior end and the front lower angle of second thoracic segment about as long as the basal joint. Carpus distinctly longer than the basal joint and almost twice as long as deep. Chela (fig. 5c) distinctly longer than the carpus, about three times as long as broad; movable finger somewhat longer than the front margin of the hand; both fingers very acute; fixed finger near the base considerably broader than the movable and with an acute tooth somewhat from the end of the incisive margin.

Thoracic segments (fig. 5a) peculiarly shaped, decreasing in breadth from second to seventh, the latter being only slightly more than half as broad as the second; furthermore the segments increase a little in length from the second to the fourth and then decrease to the seventh. Second segment decreases very conspicuously in breadth from the antero-lateral, protruding angles to the pos-

terior margin; it is unusually large, slightly more than half as long as the carapace, somewhat or a little less than twice as broad as long, a little or somewhat shorter than third segment and without any process below. Third to seventh segments with their lateral margins strongly angular or, in the three posterior segments, very convex, but the angles or the broadest place of the segment is on the third segment situated not much behind the front margin, on the fourth a little more backwards, on the fifth at the middle, on the sixth somewhat behind the middle and on the seventh a little before the posterior margin. — The legs are rather long and slender; second pair have the sixth joint (fig. 5b) almost as long as fifth and fourth joints combined and only a little longer than seventh joint with claw; the few setæ of the legs short. Third pair rather similar to second, but sixth joint is a little shorter and seventh joint with claw only about two-thirds as long as sixth joint; setæ short. Fourth pair completely as the third. Seventh pair (fig. 5d) slender; second joint almost five times as long as broad; fourth and fifth joints not expanded, with a tooth-shaped spine at the distal posterior angle; sixth joint somewhat longer than the fifth; seventh joint with claw more than half as long as sixth joint.

Abdomen scarcely as long as the two preceding segments combined. — Uropods long and slender (figs. 5a and 5e); endopod two-jointed, with first joint somewhat or a little less than twice as long as the second; the exopod reaches the middle of the distal joint of the endopod and seems to be undivided.

Length of a female with marsupium 1.6 mm, of a large female without marsupium 1.85 mm.

Subadult Male. Differs from the female only in the antennulæ, which have the distal part of first joint and the whole second joint somewhat thicker than in the female, while the third joint has the basal part distinctly thickened on the lower side.

Remarks. *T. irregularis* is easily distinguished from all other forms of the genus excepting *T. macrocephala* n. sp. and *T. mucronatus* n. sp. by the shape and relative length and breadth of the thoracic segments; the rather short antennulæ, the legs and the uropods afford further characters. It bears some resemblance to *T. macrocephala*, but the latter species is easily distinguished by its extremely large carapace, the enormous process on the lower side of second thoracic segment, etc. From *T. mucronatus* it is easily separated by the widely different antennæ, short setæ on the legs, etc.

Occurrence. The "Ingolf" has taken this fine species at twelve stations, all in the cold area.

North of the Færoes:	St. 141: Lat. 63° 22′ N., Long. 6° 58′ W., 679 fm., temp. ÷ 0.6°; 22 spec.	
— - - —	St. 139: Lat. 63° 36′ N., Long. 7° 30′ W., 702 fm., temp. ÷ 0.6°; ab. 50 spec.	
East of Iceland:	St. 104: Lat. 66° 23′ N., Long. 7° 25′ W., 957 fm., temp. ÷ 1.1°; 1 spec.	
— - —	St. 103: Lat. 66° 23′ N., Long. 8° 52′ W., 579 fm., temp. ÷ 0.6°; 1 spec.	
— - —	St. 102: Lat. 66° 23′ N., Long. 10° 26′ W., 750 fm., temp. ÷ 0.9°; 21 spec.	
North of Iceland:	St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 2 spec.	
— - —	St. 125: Lat. 68° 08′ N., Long. 16° 02′ W., 729 fm., temp. ÷ 0.8°; 12 spec.	
North-East of Iceland:	St. 120: Lat. 67° 29′ N., Long. 11° 32′ W., 885 fm., temp. ÷ 1.0°; 2 spec.	
— - —	St. 119: Lat. 67° 53′ N., Long. 10° 19′ W., 1010 fm., temp. ÷ 1.0°: 2 spec.	
South of Jan Mayen:	St. 118: Lat. 68° 27′ N., Long. 8° 20′ W., 1060 fm., temp. ÷ 1.0°; 6 spec.	
— - - —	St. 117: Lat. 69° 13′ N., Long. 8° 23′ W., 1003 fm., temp. ÷ 1.0°; ab. 40 spec.	

South of Jan Mayen: St. 113: Lat. 69° 31′ N., Long. 7° 06′ W., 1309 fm., temp. + 1.0°; 7 spec.

Distribution. A single ovigerous female has been found between some material from the Kara Sea brought home by the "Dijmphna" Expedition.

22. **Typhlotanais macrocephala** n. sp.

(Pl. III, figs. 6a—6e.)

Specimen without marsupium. Body almost five and a half times as long as broad. — Carapace (fig. 6a) exceedingly large, nearly longer than second, third and half of fourth segment combined, considerably longer than broad; the anterior margin only a little shorter than the posterior, with the frontal process constituting a broad, rather low triangle with the margins along the base of the antennulæ very feebly concave; the carapace is broadest at the end of the anterior two-thirds, and the major part of its lateral margins are somewhat convex and posteriorly with a few saw-teeth or fine indentations.

The antennulæ (fig. 6b) are short and thick, conical, only half as long as the carapace. First joint about half as long again as deep; the two distal joints combined about as long as the depth of the first joint; second joint much deeper than long; third joint proportionately thick at the base, conical, with the terminal setæ about as long as the first joint. — Antennæ short and moderately thick; third joint not thickened, fourth considerably less than twice as long as the penultimate joint; terminal setæ nearly as long as those of the antennulæ.

Chelipeds somewhat small (fig. 6b). Posterior protuberance on the basal joint short; the distance between its hind margin and the anterior lower angle and second thoracic segment considerably longer than the basal joint. Carpus considerably longer than the basal joint, about twice as long as deep. Chela a little longer than the carpus, only about two and a half times as long as broad; movable finger distinctly longer than the front margin of the hand; fixed finger thick at the base, with a tooth before the end.

Thoracic segments (fig. 6a) somewhat similar in general shape and relative dimensions to those of *T. irregularis*, but the major posterior part of the lateral margins of second to fourth segment with four or five distinct teeth (fig. 6c). Second segment slightly narrower than the carapace, not fully twice as broad as long, broadest at the angle a little behind the anterior margin and decreasing much in breadth posteriorly; seen from the side (fig. 6b) this segment is expanded downwards below and the expansion produced in an enormous process, the base of which is as long as the segment, while the posterior margin is regularly convex, the anterior margin deeply concave and the end of the process acute and directed somewhat forwards. Third segment scarcely longer and considerably narrower than the second but otherwise nearly of the same shape (fig. 6a); fourth segment about as long as the third but distinctly narrower and of similar shape. Fifth and sixth segments each scarcely as broad as the fourth and only a little more than half as broad as the carapace, while seventh segment is as broad as the fourth; the lateral margins of all three segments are considerably convex and more or less distinctly angular; fifth segment broadest a little behind the middle and the two other segments broadest somewhat behind the middle; the fifth segment has a few nearly rudimentary teeth

on the posterior part of the lateral margins. — Thoracic legs moderately long and rather slender; second pair (fig. 6b) with sixth joint only a little shorter than fifth and fourth joints combined and slightly longer than seventh joint with claw; setæ short. Third pair with sixth joint as long as the fifth plus half of the fourth; seventh joint with claw as long as fifth joint; setæ short. Seventh pair (fig. 6d) moderately long; second joint slender, nearly five times as long as broad; fourth and fifth joints moderately broad but scarcely expanded and without any armature; sixth joint proportionately somewhat stout, being not much thinner than the fifth and about as long as the fifth plus half of the fourth; seventh joint with claw quite short.

Abdomen as broad as the last thoracic segment, with the sides somewhat convex, a little shorter than the two preceding segments combined. — Uropods of moderate length (fig. 6e); endopod two-jointed with the proximal joint somewhat longer than the distal; exopod a little shorter than the endopod, two-jointed, with the proximal joint a little shorter than the distal.

Length of the single specimen (probably a female) 1.20 mm.

Remarks. This species differs from all other forms of the genus by its gigantic carapace, the very short and thick antennulæ, the huge process on the lower side of second thoracic segment and the serrate lateral margins of the three (four) anterior thoracic segments. In some other features and especially in the dorsal aspect of the thoracic segments it resembles considerably *T. irregularis* n. sp.

Occurrence. The single specimen has been captured by the "Ingolf".

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 1 spec.

23. **Typhlotanais pulcher** n. sp.

(Pl. IV, figs. 1a—1g.)

Specimen without marsupium. Body very slender, more than eight times as long as broad. — Carapace considerably longer than broad but only slightly longer than the unusually long second thoracic segment (figs. 1a and 1b), lateral margins rounded posteriorly and from there converging gradually forwards to the anterior margin, which is somewhat longer than half of the breadth of the carapace, and the rostral process is somewhat long, subacute.

Antennulæ (figs. 1b and 1c) nearly as long as the carapace, moderately slender. First joint somewhat longer than the two other joints combined, about three and a half times as long as deep, and, seen from the side, not tapering, which renders it probable that the specimen may be an immature male; second joint about as long as deep, not half as long as the third joint, which has its proximal part slightly thickened on the lower side; terminal setæ as long as the two distal joints combined. — Antennæ moderately slender; third joint not thickened; fourth joint a little more than twice as long as the penultimate, and both these joints with long setæ at the end, while the setæ of the terminal joint are still longer, though a little shorter than the longest terminal antennular setæ.

Chelipeds (fig. 1c) moderately slender. Basal joint with the proximal protuberance scarcely free and of moderate length; its posterior end far removed from the front lower end of second thoracic segment. Carpus a little less than three times as long as deep. Chela a little longer than the carpus, three times as long as broad; movable finger rather slender and much longer than the front margin

or the hand; fixed finger towards the base much broader than the movable and with about three sharp teeth along the distal part of the incisive margin.

Thoracic segments extremely characteristic (fig. 1 a). Second segment almost as long as the carapace or third segment and slightly longer than the fourth; each lateral margin is a straight line and the lateral margins converge considerably from the anterior to the posterior end; no ventral process is found. Third segment similar to the second excepting that it is broadest somewhat behind the anterior margin and the somewhat short anterior part of the lateral margin between its front end and the lateral angle is even concave. Fourth segment shaped nearly as the third. Fifth segment even slightly shorter and somewhat narrower than the fourth, with the major part of the lateral margins subparallel and the margins rounded and converging towards both ends. Sixth segment considerably shorter than the fifth and almost twice as long as the seventh, and both these segments increase somewhat in breadth from the anterior end to respectively somewhat from or near to the posterior margin. — Thoracic legs very different from each other. Second pair (fig. 1 c) long and slender; fifth joint at the anterior distal angle with a seta as long as the joint; sixth joint considerably longer than the fifth and somewhat shorter than seventh joint with claw. Third pair (fig. 1 d) considerably shorter than second, very slender; sixth joint conspicuously shorter than the fifth, nearly twice as long as seventh joint and with its anterior distal setæ somewhat long. Three posterior pairs (figs. 1 e and 1 f) moderately slender; second joint nearly four times as long as broad; fifth joint with the distal half somewhat expanded; sixth joint moderately long and somewhat slender, a little more than half as long again as seventh joint with claw.

Abdomen slightly longer than the two preceding segments combined (fig. 1 a), somewhat oval, posteriorly nearly truncate with a low, rounded median protuberance. — Uropods (fig. 1 g) short; endopod two-jointed with first joint somewhat longer than the second; exopod one-jointed, slightly longer than the proximal joint of the endopod.

Length of the specimen, which according to the antennulæ seems to be an immature male, 2.7 mm.

Remarks. This species, taken in very great depth, differs strongly from all other species of the genus by the shape and especially the relative length of the thoracic segments, the differences being in reality so great that one is tempted to regard them as being of generic value, but antennulæ, antennæ, chelipeds, thoracic legs, pleopods and uropods agree with structural features frequently found in *Typhlotanais*. The long seta at the end of fifth joint of second pair of legs is certainly a good specific character.

Occurrence. The single specimen has been taken by the "Ingolf".

South of the Davis Strait: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 1 spec.

24. **Typhlotanais gracilipes** n. sp.

(Pl. IV, figs. 2 a—2 e.)

Female (without marsupium). Body very slender, almost eight times as long as broad. — Carapace (figs. 2 a and 2 b) long and narrow, as long as second, third and the half of fourth segment

combined, more than half as long again as broad; the lateral margins feebly convex posteriorly and then converging to the front angles; the anterior end slightly more than half as broad as the carapace a little from the hind margin; rostral process moderately long, somewhat narrow, acute.

Antennulæ (figs. 2a and 2b) considerably shorter than the carapace, somewhat robust. First joint a good deal longer than second and third joints combined, not fully three times as long as deep and tapering considerably to the end; second joint about as long as deep; third joint conspicuously more than twice as long as the second, thin, with the longest terminal seta scarcely longer than the joint. — Antennæ of usual size; third joint not thickened; fourth joint not twice as long as the penultimate and with long setæ from its distal lower angle; longest terminal setæ much longer than those of the antennulæ.

Chelipeds very slender (fig. 2b). Basal joint with the posterior process moderately long and its proximal margin rounded; the distance between this margin and the front lower end of second segment only a little shorter than the basal joint. Carpus almost twice as long as the basal joint and a little more than three times as long as deep. Chela small, somewhat shorter than the carpus, three and a half times as long as broad; movable finger slightly longer than the anterior margin of the hand; fixed finger near the base considerably broader than the movable.

Thoracic segments, as far as could be ascertained in the mutilated specimen, in the main as in *T. mucronatus* n. sp. (comp. description and figs. 3a of this species), but the difference between the anterior and the posterior breadth of each segment seems to be a little smaller and the lateral margins of the segments a little less convex (fig. 2a). Second segment (figs. 2a and 2b) only slightly more than half as long as the third and without ventral process. — Thoracic legs on the whole slender. Second pair (fig. 2b) slender and moderately long; fourth and fifth joints with the distal anterior setæ somewhat long; sixth joint long, only a little shorter than fifth and fourth joints combined and without any perceptible distal anterior seta; seventh joint with claw nearly as long as sixth joint. Third pair mutilated, but scarcely much different from fourth pair (fig. 2c) which is very slender, much shorter than second pair, with a rather long seta on the distal anterior angle of fifth joint, sixth joint considerably longer than the fifth but slightly longer than seventh joint with claw. Three posterior pairs of legs peculiarly built and unusually long (fig. 2d); second joint not fully four times as long as broad; fourth and fifth joints somewhat slender, though considerably and gradually widened on the anterior side towards the end, and there with a couple of somewhat long, slender spines, fifth joint besides with a couple of slender spines on the terminal inner margin; sixth joint not much longer than the fifth, moderately slender; seventh joint and the short, thin claw combined somewhat more than half as long as sixth joint.

Abdomen about as long as the two preceding segments combined. — Uropods mutilated, but one exopod (fig. 2e) has been preserved; it is long, very slender, perhaps undivided, but the seta generally found just before the articulation is long and originates even slightly beyond the middle.

Length of the single specimen 2.05 mm.

Remarks. *T. gracilipes* is easily distinguished from all species of *Typhlotanais* described in this paper by its slender, small chelipeds and the peculiar three posterior pairs of thoracic legs with the long and slender spines on fourth and fifth joints. It is closely allied to *T. microcheles* G. O. S.,

but according to Sars' figures and my examination of some of his co-types it differs in some particulars. In *T. microcheles* the chelipeds have the basal joint about three-fourths as long as the carpus, thus considerably longer than in *T. gracilipes,* and their carpus is deeper, scarcely two and a half times as long as deep; furthermore the thoracic legs are on the whole a little more robust than in *T. gracilipes.* In a specimen of *T. microcheles* with the ventral side of the anterior thoracic segments flat and without marsupium no ventral process on second segment is found, but in three other specimens presented by Sars the ventral surface of the anterior segments is convex, the second segment has a very large, long and broad, oblique-triangular, acute ventral process directed forwards and downwards, and each of the four following segments has a somewhat smaller but yet far from small, acute, somewhat curved ventral process.

Occurrence. The single specimen was taken by the "Ingolf".

South of Iceland: St. 54: Lat. 63°08′ N., Long. 15°40′ W., 691 fm., temp. 3.9°; 1 spec.

25. **Typhlotanais mucronatus** n. sp.

(Pl. IV, figs. 3a—3h.)

Female (without marsupium). Body slender, about six and a half times as long as broad. — Carapace (fig. 3b) somewhat small, slightly broader than long, a little longer or somewhat shorter than second segment plus half of the third; the lateral margins are somewhat convex, the anterior margin is even a little more than two-thirds as long as the breadth of the carapace and the frontal process very broad, proportionately rather low and broadly rounded.

Antennulæ (figs. 3b and 3c) extremely long and slender, a little longer than carapace and second thoracic segment combined. First joint a little longer than the two other joints together, very slender excepting its proximal fourth, which is considerably thickened below and its depth is here about one-fifth of the length of the joint; seen from above (fig. 3b) the joint is rather broad at the base, tapers considerably to beyond the middle, where it is abruptly narrowed a little and its distal part is subcylindrical. Second joint is thin, almost three times as long as deep; third joint very thin, more than twice as long as the second, with the longest terminal setæ extremely long, longer than the two distal joints and half of the proximal joint combined. — Antennæ slender but somewhat short as compared with the antennulæ (fig. 3c); third joint feebly thickened; fourth joint about twice as long as the penultimate; terminal setæ long, yet conspicuously less than half as long as those of the antennulæ.

Chelipeds slender (fig. 3c). Posterior process on the basal joint moderately short; the distance between its hind margin and the front lower end of second thoracic segment about half as long as the basal joint. Carpus considerably longer than the basal joint, almost three times as long as deep. Chela (fig. 3d) slightly longer than the carpus, almost four times as long as broad; movable finger nearly half as long again as the front margin of the hand; fixed finger much broader than the movable with a few low, obtuse teeth towards the end of the incisive margin.

Thoracic segments somewhat reminding of those of *T. irregularis,* increasing in length and decreasing in breadth from second to fifth, decreasing in length and increasing in breadth from fifth

to seventh segment (fig. 3a). Second segment about twice as broad as long, with the lateral margins distinctly convex and besides converging from somewhat behind the anterior to the posterior end; the segment is below and a little behind the front end produced in a very strong, oblique-triangular, acute process directed downwards and much forwards (fig. 3c). Third segment about half as long again as the second, broadest not much behind the anterior margin, but the lateral angles somewhat rounded, and from these angles the margins converge considerably to the hind margin; fourth segment nearly as the third, but the rounded lateral angles are nearer to the middle of the segment; fifth segment as long as broad, with the lateral margins nearly regularly convex. The two posterior segments increase almost gradually in breadth to somewhat behind the middle and the posterior part of their lateral margins is convex, thus converging near the hind margin, which is longer than the front margin of the same segment. — Thoracic legs slender. Second pair long (fig. 3c); fourth joint with a long seta from the anterior distal angle; fifth joint with two long setæ from the corresponding angle; sixth joint only somewhat longer than the fifth, with the setæ somewhat short; seventh joint with claw scarcely as long as fifth joint. Third pair somewhat shorter than the second; fifth joint with a long seta from the anterior distal angle; sixth joint as long as the fifth plus half of the fourth, with its distal anterior seta extremely long; seventh joint with claw less than half as long as sixth joint. Fourth pair in the main as the third. Three posterior pairs subsimilar, moderately long, slender (fig. 3e); second joint more than four times as long as broad; fourth joint not expanded, without spines, fifth joint (fig. 3f) with a small spine on the outer side of the end, while the joint is distally on the anterior side produced into a peculiar, short, broad, subtriangular, acute process directed forwards; sixth joint moderately strong, scarcely widened towards the end, a little longer than fifth joint and with a small spine on the anterior side a little before the end; seventh joint with claw distinctly less than half as long as sixth joint.

Abdomen a little longer than the two posterior thoracic segments combined and as broad as the second segment. — Uropods moderately short (fig. 3g); endopod two-jointed, with first joint conspicuously longer than the second; exopod scarcely reaching the middle of second joint of the endopod, without any perceptible division into two joints.

Length 2.45 mm.

Subadult Male. It differs from the female in having the antennulæ (fig. 3h) much thicker; first joint is not four times as long as deep and with nearly the same depth from base to end; the two other joints combined as long as first joint; second joint is proportionately thick, though somewhat longer than deep; third joint is conspicuously thicker than in the female and with the proximal third a little thickened below.

Remarks. *T. mucronatus* is especially distinguished by the long antennulæ with the third joint very long and in the female extremely thin, by the large ventral process on second thoracic segment, by the long setæ on some joints of the anterior pairs of thoracic legs, and by the peculiar process on fifth joint of the posterior pairs; furthermore the thoracic segments, seen from above, differ markedly from most other species.

Occurrence. It was taken by the "Ingolf" at three stations in the cold area and in very considerable depths.

North-East of Iceland: St. 120: Lat. 67° 29′ N., Long. 11° 32′ W., 885 fm., temp. ÷ 1.0°; 10 spec.
— - — St. 119: Lat. 67° 53′ N., Long. 10° 19′ W., 1010 fm., temp. ÷ 1.0°; 1 spec.
South of Jan Mayen: St. 117: Lat. 69° 13′ N., Long. 8° 23′ W., 1003 fm., temp. ÷ 1.0; 1 spec.

26. **Typhlotanais eximius** n. sp.

(Pl. IV, figs. 4a—4g.)

Female (without marsupium). The body of a somewhat contracted, not fullgrown specimen (fig. 4a) robust, somewhat less than four times as long as broad. — Carapace in the first-named specimen as long as the three following segments combined, in the second specimen (fig. 4b) somewhat longer than the two anterior segments combined; it is a little broader than long, the lateral margins posteriorly convex and then converging nearly evenly forwards to the anterior, somewhat produced angle; the front margin nearly half as long as the breadth of the carapace and the rostral process moderately large, acute.

Antennulæ long, as long as the carapace, second segment and half or almost the whole third segment combined. First joint (fig. 4b) considerably longer than the two other joints combined, about four and a half times as long as deep, and, seen from the side or from above, tapering considerably from somewhat from the base to the end. Second joint distinctly more than half as long as the third, not three times as long as deep; longest terminal seta almost as long as first and second joints combined. — Antennæ somewhat long; third joint somewhat thickened; fourth joint twice as long as the penultimate; terminal setæ very long, though somewhat shorter than those of the antennulæ.

Chelipeds (fig. 4b) long and very slender, excepting the basal joint which is somewhat thick, with the posterior protuberance thick, short, broadly rounded behind and reaching to near the front lower angle of second thoracic segment. Carpus more than half as long again as the basal joint, four times as long as deep and somewhat curved, with the lower margin conspicuously concave. Chela as long as the carpus and nearly more than six times as long as broad, with the hand very elongate, only somewhat less than twice as long as the movable finger, which is slightly thinner than the fixed finger.

Thoracic segments short in proportion to their breadth; the three anterior segments together as long as fifth and sixth segments combined; the second segment is about half as long as the third and the fourth is somewhat longer than the fifth, which is slightly longer than the sixth. The lateral margins of third and fourth segments feebly convex before the middle, of the three posterior segments a little convex or subangular rather near their posterior end. Second segment below with a moderately small, curved, acute process projecting near the front end, directed downwards and much forwards. — Thoracic legs slender. Second pair (fig. 4b) long; fifth joint with the distal anterior seta moderately short, sixth joint somewhat longer than the fifth and considerably longer than seventh with claw. Third pair not much shorter than second; fourth and fifth joints with the seta on the distal anterior angle somewhat long; sixth joint with the distal anterior seta somewhat long; seventh joint with

claw less than half as long as sixth joint. Sixth and seventh pairs (fig. 4c) much shorter than the anterior pairs; second joint about three and a half times as long as broad; fourth and fifth joints very moderately thickened towards their end, sixth joint somewhat long and slender, twice as long as seventh joint with claw.

Abdomen proportionately long, in the contracted specimen (fig. 4a) even slightly shorter than the three posterior thoracic segments combined. — Uropods (figs. 4a and 4d) long; endopod two-jointed, with first joint somewhat longer than second; exopod slightly shorter than the endopod, two-jointed, with the proximal joint about half as long as the distal.

Length of the largest specimen 1.50^{mm}, of the contracted specimen (fig. 4a) 1.19^{mm}.

Immature Male. A single specimen, only 1.0^{mm} long, is at hand, and its most important parts are rendered in figs. 4e—4g. Some of the differences between this specimen and the two above-described females are due to sex, other differences probably to age. The antennulæ are considerably thicker than in the female; first joint, which is as long as the two other joints combined, is only three times as long as deep and tapers slightly towards the end; second joint is conspicuously less than twice as long as deep, third joint more than twice as long as the second. — Antennæ with fourth joint distinctly less than twice as long as the penultimate joint. — The chela is slightly thicker than in the female with the hand conspicuously less elongate in proportion to the length of the movable finger. — The anterior pairs of legs are a little thicker in proportion to length than in the larger female. Uropods with the rami equal in length.

Remarks. *T. eximius* is easily distinguished from all other species by its very slender chelipeds with the very elongate chelæ and the hand very long in proportion to the fingers. In all other features it is allied to *T. penicillatus* G. O. S., differing only in various minor particulars, among which the most conspicuous is the fact, that in *T. penicillatus* the exopod of the uropods (fig. 5c) reaches scarcely or slightly beyond the middle of the second joint of the endopod.

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

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 3 spec.

27. **Typhlotanais penicillatus** G. O. Sars.

(Pl. IV, figs. 5a—5d.)

1881. *Typhlotanais penicillatus* G. O. Sars, Arch. for Math. og Naturv. B. 7, p. 39.

! 1896. — — — Account Crust. Norway, Vol. II, p. 25, Pl. XI, fig. 3.

The "Ingolf" specimens agree well with Sars' description and figures of this species excepting that the setæ on the chelipeds are considerably longer, but that may be due to an accident or a slight error. Furthermore Sars stated that the exopod of the uropods is one-jointed, while it is two-jointed in my specimens, but the articulation between the two joints is not always really distinct.

T. penicillatus is closely allied to *T. eximius* n. sp., but differs especially in having the chelipeds shorter and much thicker and in having the exopod of the uropods (fig. 5c) conspicuously shorter than the endopod; furthermore the antennulæ, antennæ and anterior thoracic legs (fig. 5a) are in my largest specimens conspicuously shorter and thicker than in *T. eximius*; third pair of legs with

a small spine on the posterior side and near the end of sixth joint. It agrees above all with *T. eximius* in having the carapace considerably longer than the two anterior thoracic segments combined, in having the antennulæ and antennæ terminating in extremely long setæ and in possessing an acute process (on fig. 5a overlapped and therefore rendered by dotted lines) on the ventral side of second thoracic segment. — The chelipeds are characteristic; the carpus is considerably longer than the basal joint and about two and a half times as long as deep; the chela is a little or somewhat longer than the carpus, between three and a half and four times as long as broad, and the movable finger is only a little shorter than the anterior margin of the hand.

Marsupium is not found in any of my specimens. Somewhat young specimens are on the whole more clumsy, with the appendages shorter and more robust than in nearly fullgrown specimens. The largest specimen at hand is 1.56^{mm}. — In a specimen measuring 1.27^{mm} the antennulæ (fig. 5d) are considerably thicker, shaped nearly as in the young male of *T. eximius*, and therefore I consider this specimen to be an immature male.

Occurrence. *T. penicillatus* was brought home by the "Ingolf" from two stations.

Denmark Strait: St. 90: Lat. 64° 45′ N., Long. 29° 06′ W., 568 fm., temp. 4.4°; 1 spec.

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 15 spec.

Distribution. Sars established this fine species on two specimens taken by him "at Sauesund, west coast of Norway, from depths of 50 to 100 fathoms".

28. **Typhlotanais inermis** n. sp.

(Pl. IV, figs. 6a–6g.)

Female (without marsupium). Moderately robust, about five and a half times as long as broad. — Carapace (figs. 6a and 6b) about as long as the two following segments combined, slightly longer than broad, with the lateral margins slightly converging from the base to beyond the middle and then more curved to the antero-lateral angles which are somewhat removed from the outer base of the antennulæ; the distance between these angles is more than two-thirds as long as the breadth of the carapace in front of its posterior margin, and from each angle the anterior margin is directed inwards and somewhat forwards to the acute median angle, each half of this front margin being slightly concave; the result is, that the carapace is pentagonal.

Antennulæ nearly as long as carapace and half of the next segment combined, very slender. First joint is, seen from the side, between four and five times as long as deep and tapers considerably from somewhat beyond the base to the end (fig. 6a); seen from above (fig. 6b) this joint has the basal fifth very broad, the outer margin angular at the end of that fifth, and from this angle the joint, which is distinctly less than three times as long as broad, tapers strongly to the distal end; it is somewhat longer than the two other joints combined. Second joint slender; third joint more than twice as long as the second, very slender, with the terminal setæ very long, the longest being somewhat longer than the two proximal joints combined. — Antennæ of moderate length, rather slender; second joint somewhat expanded above, third scarcely thickened, fourth somewhat less than twice as long as the penultimate joint; some of the terminal setæ about half as long as the long setæ of the antennulæ.

Chelipeds (fig. 6c) moderately robust. Basal joint with the posterior protuberance somewhat short, posteriorly rounded; its hind margin rather distant from the lower front angle of second thoracic segment. Carpus a little longer than the basal joint and a little more than twice as long as deep, with both margins feebly convex. Chela (fig. 6d) as long as the carpus, a little more than three times as long as broad; movable finger somewhat longer than the anterior margin of the hand; fixed finger much broader than the movable, with about three teeth along the distal part of the incisive margin and the last tooth rectangular and much larger than the two other teeth.

Thoracic segments (fig. 6a) differ slightly in breadth; all are subrectangular with the angles a little rounded; the major part of their lateral margins parallel or feebly convex. Second segment conspicuously less than half as long as the third, without any process below. The segments increase in length from the second to the fifth and decrease from the fifth to the seventh, but the fourth segment is slightly longer than the third and slightly shorter than the fifth. — The anterior legs moderately long and slender. Second pair (fig. 6c) with a very long seta both from the anterior and the posterior distal angle of fifth joint; sixth joint about as long as fifth joint plus half of the fourth, with the distal setæ short; seventh joint with claw slightly longer than sixth joint. Third pair somewhat shorter than second; fourth joint with a long seta from the distal posterior angle, fifth joint with a very long seta both from the anterior and the posterior distal angle; sixth joint somewhat longer than fifth, with short setæ; seventh joint with claw distinctly more than half as long as sixth joint. Sixth and seventh pairs (fig. 6e) with the second joint somewhat widened, two and a half times as long as broad; fourth joint feebly tapering and with a short spine at the distal anterior angle (fig. 6f); fifth joint moderately broad, slightly broader towards the end and with a small, low, glabrous protuberance just before the end of the anterior margin and a minute spine at the end; sixth joint only a little longer than the fifth, very moderately slender, with a spine near the distal anterior angle; seventh joint with claw about half as long as sixth joint.

Abdomen somewhat longer than and as broad as the two preceding segments combined. — Uropods somewhat short; endopod (fig. 6g) two-jointed, with first joint slightly longer than the second; exopod slightly or a little longer than the proximal joint of the endopod.

Length of females without marsupium 2.3 mm; females with marsupium unknown.

Immature Male. Differs from the female in the antennulæ, which are thickened as in the young male of *T. mucronatus*.

Remarks. This species is allied to *T. penicillatus*, but it is somewhat larger, a little more slender and differs in the shape of the carapace, in having seventh joint with claw of second and third pairs of legs much longer in proportion to the sixth joint, in possessing long or very long setæ on fifth joint of these legs, in having the exopod of the uropods considerably shorter and unjointed, and no ventral process on second thoracic segment. *T. penicillatus* is a warm water species, while *T. inermis* is known only from the cold area, with the temperature below zero.

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

North of the Færoes: St. 141: Lat. 63° 22′ N., Long. 6° 58′ W., 679 fm., temp. ÷ 0.6°; 1 spec.

— - - — St. 138: Lat. 63° 26′ N., Long. 7° 56′ W., 471 fm., temp. ÷ 0.6°; 1 spec.

North of the Færoes: St. 139: Lat. 63° 36′ N., Long. 7° 30′ W., 702 fm., temp. ÷ 0.6°; 10 spec.
East of Iceland: St. 102: Lat. 66° 23′ N., Long. 15° 52′ W., 750 fm., temp. ÷ 0.9°; 6 spec.

29. **Typhlotanais variabilis** n. sp.

(Pl. IV, figs. 7a—7d; Pl. V, figs. 2a—2c.)

Female. Moderately slender (fig. 7a), about six times as long as broad. — Carapace somewhat or considerably shorter than the two following segments combined, somewhat longer than broad, with the lateral margins convex posteriorly and their anterior two-thirds converging to the anterior angles; the anterior end slightly more than half as broad as the carapace somewhat before its posterior margin; the rostral process well developed, acute.

Antennulæ scarcely as long as the carapace and half of the next segment combined, rather slender (fig. 2a). First joint from a little more than four to five times as long as deep and, seen from the side or from above, tapering regularly from near the base to the end, considerably longer than the two other joints combined; second joint twice (fig. 2b) or conspicuously more than twice (fig. 2a) as long as deep and more than half as long as third joint; longest terminal seta slightly or somewhat longer than the two distal joints combined. — Antennæ of normal size; third joint scarcely thickened; fourth joint slightly or distinctly more than twice as long as the penultimate; terminal setæ conspicuously shorter than those of the antennulæ.

Chelipeds (fig. 2a) somewhat long, moderately slender. Basal joint with the posterior protuberance of moderate length; the distance between its hind margin and the front lower end of second thoracic segment about half as long as the joint. Carpus half as long again as the basal joint, three times or a little more than three times as long as deep, with the lower margin nearly straight. Chela somewhat longer than the carpus, not fully four times as long as broad; movable finger a little longer than the anterior margin of the hand; fixed finger much broader than the movable, with a feeble tooth near the end of the incisive margin.

Thoracic segments (fig. 7a) increase feebly in breadth from second to seventh. Second segment with the lateral margins feebly converging from the front to the posterior end. Third and fourth segments broadest somewhat before the middle, but the lateral angles at the broadest place of the segments are somewhat rounded and from thence the margins converge moderately to the hind margin. Fifth and sixth segments broadest somewhat from the posterior margin and their lateral margins are somewhat convex; seventh segment with the anterior half of the lateral margins convex, the posterior half straight. Second segment without any ventral process in the single female with marsupium and in a female of the same size with the ventral side of the anterior segments flat; in all other specimens the ventral side of the anterior segments is convex as in the subadult male (fig. 2c) and second segment has a conspicuous, acute ventral process projecting downwards and much forwards from the anterior part of the segment. — Thoracic legs of moderate length and rather slender. Second pair (fig. 2a) with the distal setæ on fourth and fifth joints somewhat short or moderately long; sixth joint as long as the fifth plus half of the fourth, with the distal setæ somewhat short; seventh joint with claw somewhat shorter than sixth joint. Third pair somewhat or rather considerably shorter

than second pair, because fourth, fifth and sixth joints are conspicuously shorter than in the last-named pair; the distal anterior setæ on fourth, fifth and sixth joints somewhat long, and in one specimen the distal posterior seta on fourth joint was very long; seventh joint with claw distinctly more than half as long as sixth joint. Three posterior pairs of legs (fig. 7b) with second joint about three times as long as broad; fourth joint (fig. 7c) with two distal short spines on the anterior side; fifth joint somewhat thick, with a rounded expansion on almost the distal half of the anterior margin and a few tiny spinules on that expansion; sixth joint about as long as the fifth plus half of the fourth, twice as long as seventh joint with claw.

Abdomen not fully as long as the two preceding segments combined, but a little broader than the last thoracic segment. — Uropods somewhat long and slender (fig. 7d); endopod with the proximal joint a little or slightly longer than the distal; exopod distinctly longer and more slender than the endopod, two-jointed, and the distal joint almost twice as long as the proximal.

Length of a female with marsupium and of the largest female without marsupium 2.4 mm.

Subadult Male. The antennulæ are thick (fig. 2c); first joint only a little more than three times as long as deep and tapers a little towards the end; second joint about as long as deep; third joint with the proximal half somewhat thickened below. Ventral process on second thoracic segment well developed (fig. 2c). Abdomen a little longer than the two preceding segments combined.

Remarks. *T. variabilis* is easily distinguished from all other species of *Typhlotanais* mentioned here or found at Norway by having the exopod of the uropods distinctly longer than the endopod. In various features it is allied to *T. penicillatus*.

As to the variation in presence or absence of a ventral process on second thoracic segment I refer to the statements on p. 7.

Occurrence. *T. variabilis* has been taken by the "Ingolf" at three stations, all in the cold deep-sea area.

North of the Færoes: St. 139: Lat. 63° 36′ N., Long. 7° 30′ W., 702 fm., temp. ÷ 0.6°; 3 spec.
East of Iceland: St. 105: Lat. 65° 34′ N., Long. 7° 31′ W., 762 fm., temp. ÷ 0.8°; 3 spec.
— - — St. 102: Lat. 66° 23′ N., Long. 10° 26′ W., 750 fm., temp. ÷ 0.9°; 2 spec.
(One of these specimens, represented in fig. 2a, has a minute parasitic Copepod (♂) fixed on the base of second left leg.)

30. **Typhlotanais trispinosus** n. sp.

(Pl. V, figs. 4a—4f.)

Female (without marsupium). Body slender, nearly seven and a half times as long as broad (fig. 4a). — Carapace about as long as the two following segments combined, somewhat longer than broad; its lateral margins converge slightly from near the base to somewhat from the front end where they are more curved; the front end is a little more than half as broad as the carapace near its base, and the rostral process is well developed, somewhat narrow, acute.

Antennulæ (fig. 4b) nearly or scarcely as long as the carapace, moderately slender. First joint about three and a half times as long as deep, somewhat tapering and somewhat longer than the two

other joints combined; second joint considerably longer than deep; third joint conspicuously more than twice as long as the second, with the longest terminal seta about as long as the joint. — Antennæ rather long; second and third joints (fig. 4c) very thick, third joint on the lower side with three strong, spiniform and nearly hook-shaped processes directed much backwards; second joint with a similar process a little behind the front lower angle and sometimes besides a minute, acute denticle behind the hook; fourth joint is distinctly more than twice as long as the penultimate joint, and the terminal setæ nearly as long as those of the antennulæ.

Chelipeds (fig. 4b) somewhat long and strong. Basal joint with the posterior protuberance somewhat long and rounded behind; the distance between its hind margin and the lower front end of second thoracic segment distinctly more than one-third of the length of the joint. Carpus much longer than the basal joint and nearly three times as long as deep. Chela as long as the carpus and little more than three times as long as broad; movable finger nearly as long as the front margin of the hand; fixed finger inconsiderably thicker than the movable, with low teeth towards the end of the incisive margin.

Thoracic segments (fig. 4a), taken together, with the lateral margins parallel excepting in front and behind, as the margins of second segment converge somewhat from near the front end to the hind margin, while those of seventh segment converge in the opposite direction. Second segment somewhat or considerably shorter than the third, below a little behind the front angle with a somewhat small, subacute process directed mainly forwards (fig. 4b). Third, fourth and sixth segments nearly equal in length, nearly as long as broad and only a little shorter than fifth segment. — Thoracic legs somewhat short. Second pair (figs. 4b and 4d) with fourth joint distinctly longer than the fifth and without setæ; seta on the anterior angle of fifth joint somewhat short; sixth joint a little shorter than fifth and fourth joints combined, and the seta on the anterior side stiff and only a little longer than the diameter of the joint; seventh joint with claw about as long as fourth joint; the third joint on the posterior side with an extremely long, strong seta reaching the end of fifth joint. Third pair with the seta on third joint proportionately still longer than that on second pair; fourth, fifth and sixth joints conspicuously shorter than in second pair, but preserving the same proportion as to length and similarity as to setæ; seventh joint with claw considerably less than half as long as sixth joint. Fourth pair with the same enormous seta on third joint. Seventh pair (fig. 4e) is rather robust; second joint expanded, only about twice as long as broad; third joint scarcely distinguishable; fourth and fifth joints much widened, with curved rows of very fine spines on the outer side and on the convex margin; sixth joint is not much longer than the fifth, with some five minute incisions along the longest margin and at the end with a long seta and two strong, moderately long spines pectinate along the concave margin; seventh joint very short and the claw minute. Sixth pair of legs are a little, and fifth pair somewhat, more slender than seventh pair, with seventh joint conspicuously longer and thinner, while fourth and fifth joints are adorned in the main as in seventh pair.

Abdomen somewhat shorter than the two preceding segments combined. — Uropods short, both rami one-jointed and the endopod somewhat longer than the exopod.

Length 2 mm.

Remarks. *C. trispinosus* in closely allied to *T. tenuicornis* G. O. S. Both these species agree

with each other and differ from all other species known by two very peculiar characters: the lower side of second and third joints of the antennæ is furnished with strong, hook-shaped processes, and the third joint of the three anterior pairs of thoracic legs bears an extremely long seta. But before mentioning the differences between *T. trispinosus* and *T. tenuicornis* I may write some remarks on Sars' description and figures of the last-named species. I have studied some co-types presented to our Museum by Sars, and have drawn three analytical figures (Pl. V, figs. 3a—3c) for comparison with my figures of *T. trispinosus*.

Sars described and figured the antennæ of *T. tenuicornis* as having two strong hooks on third joint and none on second joint, but in his co-types I find two strong hooks on each of these joints (fig. 3a). Sars' figure of the second leg is not quite correct; I have found (fig. 3b) the very long seta on the posterior angle of fourth joint, but no seta on the posterior angle of fifth joint; it does not seem probable that the last-named seta exists though it has been drawn by Sars, but we have both figured a moderately short and thin and a rather long, strong seta on the anterior angle of that joint; finally, the seta on the anterior margin of sixth joint is very strong, nearly spiniform, and, as also drawn by Sars, more than half as long as the joint, and seventh joint with claw is only as long as fifth joint, being too long in Sars' figure. Third pair of legs (fig. 3c) nearly as drawn by Sars, excepting that fifth joint has a minute denticle — as in *T. trispinosus* — and no seta at the posterior distal angle, furthermore fourth joint has only a moderately long seta on the posterior angle. The three posterior pairs of legs have their fourth and fifth joints adorned with rows of very fine spines in the main as in *T. trispisosus*.

T. trispinosus differs from *T. tenuicornis* especially in the armature of second and third antennal joints and in the feebler development of setæ on fourth to sixth joints of second pair of legs. The difference in the armature of the antennal joints is easily seen from my descriptions and figures of these parts of both species. A comparison of my fig. 3b with fig. 4c shows that the two long setæ found on the posterior angle of fourth joint and the anterior angle of fifth joint of second legs in *T. tenuicornis* are wanting in *T. trispinosus*, furthermore that the stiff seta on sixth joint is proportionately twice as long in the former as in the latter species. Finally it may be pointed out that antennulæ, antennæ, chelipeds and thoracic legs are thicker in proportion to length in *T. trispinosus* than in *T. tenuicornis*. The last-named species is known only from the west coast of Norway, from depths ranging between 60 and 120 fathoms, and from Skager Rak, N. N. E. of the lighthouse of the Skaw, 125 fm. (H. J. Hansen).

Occurrence. *T. trispinosus* has been taken by the "Ingolf" at a single station.

Davis Strait: St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 17 spec.

31. **Typhlotanais profundus** n. sp.

(Pl. V, figs. 5a—5e.)

Female (without marsupium). Body moderately robust, not fully six times as long as broad (fig. 5a). — Carapace a little longer than the two following segments combined and about as long as broad; the lateral margins conspicuously convex and the anterior end slightly more than half as broad as the carapace somewhat before the posterior margin; the frontal process moderately large.

Antennulæ slightly longer than the carapace. First joint is even more than half as long again as the two other joints combined, seen from the side (fig. 5c) almost four times as long as deep and tapering much from near the base to the end; seen from above (fig. 5b) this joint is somewhat less than three times as long as broad and the distal half is much narrower than the proximal, which has the outer margin a little angular somewhat from the base and the limit between the proximal and the distal part incised and furnished with an outstanding seta. Second joint is, seen from the side, more than twice as long as deep; third joint is somewhat less than twice as long as the second, and its longest terminal setæ about as long as the first joint. — Antennæ (fig. 5c) of normal length; third joint is distinctly thickened, fourth joint slightly more than twice as long as the penultimate; terminal setæ only a little shorter than those of the antennulæ.

Chelipeds (fig. 5e) moderately stout. Basal joint somewhat long, with the posterior protuberance of middle length, rounded behind and reaching to near the front margin of second segment; carpus considerably longer than the basal joint and somewhat less than three times as long as deep. Chela slightly longer than the carpus, about three and a half times as long as broad and with the posterior margin considerably concave; movable finger as long as the anterior margin of the hand and a little narrower than the fixed finger.

Thoracic segments (fig. 5a) show a little difference in breadth. Second segment somewhat more than half as long as the third, anteriorly as broad as, or a little narrower than, the carapace, with the lateral margins somewhat converging to the posterior margin and below a moderately small ventral process curved forwards and originating near the front end. Third, fourth and sixth segments with their lateral margins nearly parallel and the corners rectangular; fifth and sixth segments with the lateral margins diverging a little from the anterior to the posterior end; third segment slightly shorter than the fourth, which is as long as the sixth, a little shorter than the fifth and half as broad again as long. — Thoracic legs of moderate length and thickness. Second pair (fig. 5e) with somewhat short setæ; sixth joint long, even a little longer than fifth plus half of the fourth; seventh joint with claw slightly longer than fifth joint. Third pair with fourth to sixth joint conspicuously shorter than in second pair; sixth joint only a little shorter than fourth and fifth joints combined, twice or more than twice as long as seventh joint with claw; setæ somewhat short. Three posterior pairs nearly as in *T. inæquipes* (comp. fig. 9a); second joint about two and a half times as long as broad; fourth joint with a minute tooth; fifth joint a little expanded; sixth joint somewhat slender and almost as long as the two preceding joints combined; seventh joint with claw of middle length.

Abdomen not broader than the posterior part of the thorax but somewhat longer than its two posterior segments combined. — Uropods short (fig. 5d); endopod two-jointed, with the proximal joint a little longer than the distal; the exopod reaches beyond the middle of second joint of the endopod and seems to be one-jointed.

Length of the largest specimen 1.76 mm.

Subadult Male (fig. 5e). Antennulæ about as long as the carapace and half of the next segment combined, thick; first joint somewhat longer than the two other joints combined, seen from the side somewhat less than three times as long as deep and slightly tapering towards the end;

second joint about as deep as long; third joint twice as long as second, with the most proximal part feebly thickened below.

Remarks. This species is allied to *T. finmarchicus* G. O. S. and *T. mixtus* n. sp., but differs considerably in the antennulæ, which have much longer terminal setæ and the first joint in the female very differently shaped; furthermore the exopod of the uropods seems to be one-jointed in *T. profundus*, while it is distinctly two-jointed in the two other species.

Occurrence. *T. profundus* has been taken by the "Ingolf" at a single station.

South of the Davis Strait: St. 38: Lat. 59°12′ N., Long. 51°05′ W., 1870 fm., temp. 1.3°; 4 spec.

32. **Typhlotanais spinicauda** n. sp.

(Pl. V, figs. 6a—6h.)

Female (without marsupium). Body somewhat slender, seven times as long as broad. — Carapace (fig. 6a) somewhat longer than the two following segments combined and considerably longer than broad, seen from above subcylindrical excepting its anterior third, which has the lateral margins converging forwards and distinctly convex; the anterior end almost two-thirds as broad as the base, with the frontal process of moderate size, acute.

Antennulæ (figs. 6a and 6c) conspicuously shorter than the carapace, somewhat robust. First joint more than half as long again as the two other joints combined, seen from the side little more than three times as long as deep and tapering very moderately; seen from above not quite two and a half times as long as broad and tapering regularly from base to end. Second joint short and slightly longer than deep; third joint nearly three times as long as the second, and its terminal setæ seem to be a good deal shorter than the joint. — Antennæ of normal length; third joint not thickened; fourth joint twice as long as the penultimate; terminal setæ considerably longer than those of the antennulæ.

Chelipeds (figs. 6b and 6d) of moderate length and thickness. Basal joint with the proximal protuberance scarcely as long as deep and its posterior margin not far from the front lower angle of second segment; carpus much longer than the basal joint, a little more than two and a half times as long as deep. Chela small, considerably shorter than the carpus, a little more than three times as long as broad; movable finger as long as the anterior margin of the hand; fixed finger near the base conspicuously broader than the movable.

Thoracic segments, seen from above, cylindrical with parallel margins. Second segment half as long as the third, with a conspicuous, oblong-triangular, acute, horizontal ventral process originating somewhat behind the front end of the segment (fig. 6b). Third and fourth segments with their front lateral angles produced in small, acute triangles only visible from the side (fig. 6b). — Thoracic legs short. Second pair (fig. 6e) somewhat slender with the setæ short; sixth joint as long as the fifth and half of the fourth combined; seventh joint with claw a little shorter than sixth joint. Third pair (fig. 6f) considerably shorter and distinctly thicker than the second, with short setæ; sixth joint a little shorter than the two preceding joints combined, seventh joint with claw conspicuously more than half as long as sixth joint. Sixth pair (fig. 6g) with the second joint somewhat expanded, slightly more than twice as long as broad; fourth and fifth joints rather broad and fourth joint with a distinct,

distal marginal tooth; seventh joint proportionately long, together with the short and thin claw slightly shorter than the sixth joint.

Abdomen at the middle of the hind margin with a short, protruding plate (fig. 6h), and each angle of the plate produced in a spiniform process; the distance between the end of each process and the hind margin is slightly longer than the breadth of the plate. — Uropods moderately long; endopod two-jointed (fig. 6h), with the proximal joint a little longer than the distal and with some minute spines along its inner margin; exopod a little shorter than the proximal joint of the endopod, two-jointed, with the joints equal in length.

Length of the single specimen 2.0 mm.

Remarks. *T. spinicauda* is easily distinguished from all other species by the plate with its two spines protruding from the end of abdomen; the uropods are also very characteristic. In several features it is allied to *T. finmarchicus* G. O. S.

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

Davis Strait: St. 28: Lat. 65° 14′ N., Long. 55° 42′ W., 420 fm., temp. 3.5°; 1 spec.

33. **Typhlotanais grandis** n. sp.

(Pl. V, figs. 7a—7e.)

Specimen without marsupium, probably an immature Male. Very large and somewhat slender, scarcely six and a half times as long as broad, but especially fifth thoracic segment is a good deal more narrow than carapace or abdomen (fig. 7a). — Carapace large, slightly longer than the two following segments combined and somewhat longer than broad; the lateral margins posteriorly convex but their anterior two-thirds converge nearly regularly to the front angles; the anterior end is a little more than half as broad as the carapace somewhat behind the middle; the rostral process is broad, somewhate short, acute.

Antennulæ (fig. 7b) a little shorter than the carapace. First joint slightly longer than the two other joints combined, slightly more than two and a half times as long as deep and, seen from the side, scarcely tapering, seen from above distinctly and regularly tapering from base to end. Second joint a little deeper than long; third joint long, about three times as long as the second and its proximal fourth distinctly thickened above; terminal setæ about as long as third joint. — Antennæ of normal length and thickness; third joint scarcely expanded; fourth joint a little more than twice as long as the penultimate joint; terminal setæ a little longer than those of the antennulæ.

Chelipeds (fig. 7b) moderately robust. Basal joint long with the posterior protuberance even a little longer than deep, rounded behind, but its hind margin is somewhat distant from the front lower angle of second thoracic segment; carpus as long as the basal joint, only twice as long as deep. Chela somewhat longer than carpus, three times as long as broad, with the posterior margin straight; movable finger as long as the front margin of the hand; fixed finger near the base conspicuously broader than the movable and with a small tooth a little from the end of the incisive margin.

Thoracic segments (fig. 7a) increase much in length and decrease considerably in breadth from second to fifth segment; sixth segment is slightly longer and a little broader than the fifth, much longer

and somewhat narrower than the seventh. Second segment is about half as long as the third and tapers much in breadth from the anterior to the posterior end; it has a small, oblique ventral process from the lower front end. Third segment with the lateral margins considerably converging from the anterior to the posterior angles. Fourth segment with the lateral margins strongly angular considerably before the middle and from these angles converging towards both ends. Fifth segment slightly longer than broad, and its lateral margins strongly angular somewhat behind the middle; sixth segment with the lateral margins strongly angular still nearer the posterior margin; seventh segment increases much in breadth from the anterior end to rather near the hind margin. — Thoracic legs moderately long. Second pair (fig. 7b) with the setæ short excepting the seta on the posterior margin of sixth joint; fourth joint somewhat longer than the fifth and as long as the sixth; seventh joint with claw only two-thirds as long as sixth joint. Third pair with fourth joint shorter than the fifth, which is somewhat shorter than the sixth; fourth joint with some minute spines on the posterior margin, setæ on fourth and fifth joints short, distal seta on the anterior side of sixth joint rather long; seventh joint with claw scarcely half as long as sixth joint. Three posterior pairs of legs moderately strong (fig. 7c); second joint about two and a half times as long as broad; fourth joint (fig. 7d) with a row of very short, tooth-shaped, small spines along the distal half of its anterior margin and two much larger spines before the end; fifth joint with a close row of small tooth-shaped spines along the major part of the convex front margin, a similar, curved row on the outer side, and a moderately long, very thick spine at the distal end; sixth joint only a little shorter than the two preceding joints combined, moderately stout, with a large number of quite minute denticles along the anterior part, two moderately long and very thick spines near the end and three much longer terminal spines, two of which with a few strong teeth on the concave margin and the third with a number of denticles along the major distal part of the corresponding margin; seventh joint with claw somewhat short, on seventh pair less than half as long as sixth joint, and both joint and claw with some few denticles on the concave margin.

Abdomen broader than seventh thoracic segment, but scarcely as broad as the second, slightly longer than seventh segment and half of the sixth combined; its hind margin transverse, feebly angular at the middle. — Uropods (fig. 7e) moderately long, somewhat slender; endopod with the first joint a little longer than the second; exopod reaches slightly beyond the middle of second joint of the endopod, two-jointed, with second joint about two and a half times as long as the first.

Length of the single specimen 4.18 mm.

Remarks. *T. grandis* is much larger than any other species of this genus found by Sars or the "Ingolf", but agrees in this respect with three species established by Dollfus (1897) on specimens taken by the Prince of Monaco. *T. grandis* is readily distinguished from the three last-named species by various characters (comp. Dollfus' figures) and from all forms seen by me by the peculiar armature of the posterior pairs of legs. In the shape of the thoracic segments *T. grandis* is somewhat similar to *T. irregularis*, but differs widely in several other features.

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

South of Iceland: St. 54: Lat. 63°08′ N., Long. 15°40′ W., 691 fm., temp. 3.9°; 1 spec.

34. **Typhlotanais plebejus** n. sp.

(Pl. V, figs. 8a—8g.)

Female (without marsupium). Body slender, almost eight times as long as broad, seen from above cylindrical (fig. 8a). — Carapace half as long again as broad and nearly longer than second, third and half of the fourth segment combined; the posterior halves of the lateral margins parallel, the anterior halves converging and distinctly convex; the front end somewhat more than half as broad as the carapace and the rostral process moderately developed, acute.

Antennulæ short, considerably shorter than the carapace. First joint (fig. 8b) somewhat longer than the two other joints combined, about three times as long as deep and moderately tapering from somewhat from the base to the end, seen from above nearly regularly tapering and about two and a half times as long as broad. Second joint slightly longer than deep; third joint about three times as long as the second, only moderately slender; terminal setæ a little shorter than third joint. — Antennæ somewhat long; third joint conspicuously thickened; fourth joint twice as long as the penultimate; terminal setæ somewhat shorter than those of the antennulæ.

Chelipeds (fig. 8c) rather robust. Basal joint very long, because the posterior protuberance is very elongate, more than half as long again as deep; carpus slightly longer than the basal joint, not fully two and a half times as long as deep. Chela somewhat small, somewhat shorter than the carpus and a little less than three times as long as broad, with the posterior margin conspicuously concave; movable finger somewhat shorter than the anterior margin of the hand; fixed finger at the base somewhat broader than the movable, with a low protuberance on the incisive margin a little from the end.

Thoracic segments all rectangular (fig. 8a), increasing in length from second to fifth and decreasing from fifth to seventh; second segment slightly shorter than the third, without ventral process; fifth segment considerably longer than the fourth and slightly longer than broad. — Thoracic legs on the whole somewhat short and robust. Second pair (fig. 8d) with fourth joint as long as the sixth joint; all setæ short. Third pair (fig. 8e) considerably shorter than second; fifth joint slightly longer than the fourth and not much shorter than the sixth, which is more than twice as long as seventh joint with claw; setæ short or moderately short. Fifth pair (fig. 8f) with second joint much expanded, scarcely twice as long as broad; fourth and fifth joints uncommonly broad and short; sixth joint slender and almost as long as fifth and fourth joints combined; seventh joint somewhat long and thin with a fine, curved claw. (Sixth and seventh pairs mutilated).

Abdomen almost as long as seventh, sixth and half of fourth thoracic segment combined. — Uropods somewhat short (fig. 8g); endopod distinctly two-jointed, with the first joint considerably longer than the second; exopod nearly as long as the proximal joint of the endopod, one-jointed.

Length of the single specimen 3.19 mm.

Remarks. *T. plebejus* is allied to *T. æquiremis* Lilljeborg and *T. assimilis* G. O. S., but it is instantly distinguished from both by shorter chelæ, by having the exopod of the uropods one-jointed and especially by the very long posterior protuberance on the basal joint of the chelipeds. By the last-named character it is distinguished from all other species of the genus.

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

South of the Davis Strait: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 1 spec.

35. **Typhlotanais inæquipes** n. sp.

(Pl. V, figs. 9a—9b; Pl. VI, figs. 1a—1c.)

Female (without marsupium). Body slender, a little more than seven times as long as broad, seen from above nearly cylindrical (fig. 1a). — Carapace as long as or a little shorter than the two following segments combined, not fully half as long again as broad; its lateral margins are nearly parallel from the base to near the beginning of their distal third, where they begin to converge more distinctly; the anterior end is scarcely more than half as broad as the base and the rostral process is middle-sized, acute.

Antennulæ considerably shorter than the carapace (fig. 1c), somewhat slender. First joint, seen from the side, about or not fully three times as long as deep and tapering somewhat irregularly from somewhat from the base to the end; seen from above the joint (fig. 1b) is nearly three times as long as broad and tapers nearly regularly; the joint is somewhat or considerably longer than the two other joints combined. Second joint from a little less to a little more than half as long as the third and at most about twice as long as deep; longest terminal setæ distinctly longer than third joint. — Antennæ of normal length (fig. 1c); third joint somewhat thickened; fourth joint at most half as long again as the penultimate; terminal setæ about as long as those of the antennulæ.

Chelipeds (fig. 1c) somewhat long but only moderately robust. The basal joint somewhat long, its posterior process large, a little longer than deep with its rounded hind margin considerably distant from the front margin of second thoracic segment; carpus considerably longer than the basal joint, three and a half times as long as deep. Chela a little shorter than the carpus, a little less than four times as long as broad; movable finger a little shorter than the front margin of the hand; fixed finger at the base somewhat thicker than the movable.

Thoracic segments with the lateral margins parallel excepting on second and seventh segments, on which the margins converge feebly respectively from the front angles backwards and from behind forwards. Second segment about two-thirds as long as the third, without ventral process; fifth segment a little longer than the fourth or the sixth and scarcely as long as broad. — Thoracic legs moderately strong. Second pair (fig. 1c) quite peculiar; fourth joint very elongate, about two and a half times as long as the fifth; sixth joint slightly more than half as long again as the fifth; seventh joint with claw as long as the fifth; setæ short. Third pair normal; fourth and fifth joints subequal in length; sixth joint about half as long again as the fifth and more than twice as long as the seventh with claw; the setæ moderately short excepting a somewhat long, distal seta from the side of sixth joint. Three posterior pairs not very characteristic; second joint (fig. 9a) about two and a half times as long as broad; fourth joint with a minute distal tooth; fifth joint slightly broader than the fourth, with one of the margins somewhat convex but without any distinct armature; sixth joint moderately or rather slender, almost as long as the two preceding joints combined, with a minute spine somewhat before the end; seventh joint with claw of middle length.

Abdomen slightly broader than the posterior thoracic segments and scarcely as long as the

two preceding segments combined. — Uropods somewhat short; endopod (fig. 9b) two-jointed, with the first joint somewhat longer than the second; exopod reaching about the middle of the distal joint of the endopod, divided by a suture at or slightly beyond the middle and with the proximal part of its long terminal seta quite unusually thick.

Length 2.15 mm.

Remarks. *T. inæquipes* is easily distinguished from all other species by the peculiarly elongate fourth joint of second thoracic legs. Antennæ, chelipeds and uropods afford various other characters, but the species is on the whole allied to *T. mixtus* n. sp.

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

Davis Strait: St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 38 spec.

36. **Typhlotanais finmarchicus** G. O. Sars.

(Pl. VI, figs. 2a—2b.)

1881. *Typhlotanais finmarchicus* G. O. Sars, Arch. for Math. og Naturv. B. 7, p. 36.

1896. — — G. O. Sars, Account Crust. Norway, Vol. II, p. 20; Pl. IX (Female and adult Male).

In the last-named work Sars has published a description and numerous figures of this species, which differs from all other forms of the genus, excepting *T. mixtus* n. sp., by some characters.

The antennulæ (fig. 2a) are shorter than the carapace, their first joint between more than half as long again and a little less than twice as long as the two other joints combined, about three times as long as deep; second joint conspicuously longer than deep; third joint more than twice as long as the second, with the longest terminal seta not fully as long as the joint. Second pair of legs somewhat short; sixth joint only a little longer or even shorter than seventh joint with claw. Third pair of legs with fourth and fifth joints uncommonly short in proportion to thickness, each being only about half as long again as broad; seventh joint with claw considerably more than half as long as sixth joint or only a little shorter than this joint.

Sars' figure of the carpus of the chelipeds is not correct, as its greatest depth is not situated at the end of the preceding joint, but much nearer the distal end; the carpus is between two and a half and two times as long as deep; the movable finger of the chela is a little or slightly shorter than the anterior margin of the hand. Sars' figure of the uropod does not agree with the uropods in my numerous specimens, among which some co-types presented by that author; I have drawn a normal uropod (fig. 2b) and this figure shows that in the endopod the proximal joint is less than half as long again as the distal, while in Sars' figure the proximal joint is about twice as long as the other: furthermore Sars' figure shows the proximal joint of the exopod to be almost longer than the distal, while I always found (fig. 2b) the proximal joint conspicuously shorter than the distal. Finally, it may be mentioned that the ventral side of second thoracic segment has frequently a rather small or very small, acute process originating behind the front end of the segment and directed essentially forwards, but sometimes this process could not be found in specimens where it might be expected. — As to all other features I refer to Sars; the differences between *T. finmarchicus* and *T. mixtus* are pointed out below.

Occurrence. *T. finmarchicus* has been taken by the "Ingolf" at three localities.

West Greenland: Mouth of Ameralik Fjord, at Godthaab, 5—70 fm., shells; 16 spec.

— — Inner end — — - — muddy bottom; 11 spec.

Jan Mayen: St. 115: Lat. 70°05′ N., Long. 8°26′ W., 86 fm., temp. 0.1°; large number of specimens.

Furthermore *T. finmarchicus* has been taken at Iceland by various Zoologists and at Jan Mayen and East Greenland by the second Amdrup Expedition. The localities are given here.

West Iceland: Onundar Fjord, 11—12 fm., ooze and stones with a few algæ; 2 spec. Mag. W. Lundbeck.

East Iceland: Faskrud Fjord, 20—50 fm., blue clay; 7 spec. Mag. R. Hörring.

— — Nord Fjord, 40 fm.; 1 spec. Mag. R. Hörring.

— — Bakke Fjord, 8—10 fm.; black sand; 1 spec. Dr. A. C. Johansen.

Jan Mayen: 50—60 fm. and 55 fm., 17 spec. II[d] Amdrup Exp.

East Greenland: Cape Dalton: Lat. 69°24.6′ N., ab. Long. 23½° W., 9—11 fm.; 11 spec. II[d] Amdrup Exp.

— — Turner Sound: Lat. 69°44′ N., Long. 23½° W., 3 fm.; 1 spec. - — —

— — Sabine Island: Lat. 74°30′ N., Long. 19°45′ W., 3—5 fm.; 23 spec. II[d] Amdrup Exp.

Distribution. *T. finmarchicus* was previously known from Vadsö in Varanger Fjord (North-eastern Norway), where it occurred in 30 fathoms (G. O. Sars), and from Northbrook Island, Franz Joseph Land (Th. Scott). — The list given above shows that it has a wide distribution in the arctic and subarctic areas, while it is not known from the southern and south-western coasts of Iceland or from the Færoes.

It may be mentioned here that from the "Ingolf" Stat. 104: West of Iceland: Lat. 66°23′ N., Long. 7°25′ W., 957 fm., temp. ÷ 1.1°, I have 2 specimens (an immature female and an immature male), of which especially the characteristic female certainly belongs to *T. finmarchicus*, though judging from their occurrence at that deep-sea station it would have been expected that they belonged to the closely allied *T. mixtus* n. sp. It is very improbable that *T. finmarchicus*. which has been taken at many localities in depths from 3 to 60 fathoms and never in a depth exceeding 86 fathoms, may occur in a depth of nearly a thousand fathoms; therefore I do not venture to insert that single deep-sea station in the list of localities, fearing that some error has been committed in one way or another, but the statement inexplicable at present is mentioned here.

37. **Typhlotanais mixtus** n. sp.

(Pl. VI, figs. 3a—3f.)

Female. Body slender, about seven times as long as broad, seen from above nearly cylindrical (fig. 3a). — Carapace somewhat or considerably longer than the two following segments combined, nearly half as long again as broad; lateral margins parallel to near the beginning of their distal third, then converging and distinctly convex; the anterior end not quite two-thirds as broad as the carapace, with the rostral process somewhat long, acute.

Antennulæ (figs. 3a and 3b) somewhat shorter than the carapace. First joint only somewhat longer than the two other joints combined — thus proportionately a good deal shorter than in *T. finmarchicus* — seen from the side about three times as long as deep and tapering considerably, seen from above tapering nearly regularly from near the base to the end. Second joint somewhat longer than deep, less than half as long as the third; longest terminal setæ considerably shorter than third joint. — Antennæ with third joint slightly thickened (fig. 3b); fourth joint not twice as long as the penultimate; terminal setæ almost longer than those of the antennulæ.

Chelipeds (fig. 3b) moderately long. Basal joint moderately long; the posterior protuberance a little longer than deep, and the distance between its hind margin and the front lower angle of second thoracic segment is more than half as long as the joint; carpus rather slightly longer than the basal joint, about three times as long as deep — thus less robust than in *T. finmarchicus*. Chela as long as the carpus, a little more than three times as long as broad; movable finger somewhat or a little longer than the anterior margin of the hand; fixed finger distinctly broader than the movable, with a couple of triangular teeth towards the end of the incisive margin.

Thoracic segments (fig. 3a) with their lateral margins subparallel excepting those of second segment which converge backwards. Second segment about half as long as the third, in females without marsupium generally with a moderately small or very small ventral process as in *T. finmarchicus*. Fifth segment slightly longer than the fourth or the sixth and slightly shorter than broad. — Thoracic legs somewhat short and robust. Second pair (fig. 3b) with fifth joint a little longer than the fourth and not twice as long as deep; sixth joint much longer than the fifth, about as long as or a little longer than seventh joint with claw; setæ moderately short. Third pair with fourth and fifth joints short in proportion to thickness; seventh joint with claw considerably more than half as long as the sixth; distal anterior seta on sixth joint moderately long. Three posterior pairs nearly as in *T. finmarchicus;* second joint about two and a half times as long as broad; fourth and fifth joints somewhat broad, each with a distal small spine; sixth joint about as long as fifth and half of the fourth combined; seventh joint somewhat long, together with the fine claw nearly as long as the sixth joint.

Abdomen slightly broader than seventh thoracic segment and about as long as seventh and sixth segments combined. — Uropods (fig. 3f) moderately short; endopod with the proximal joint somewhat longer than the distal; exopod scarcely reaching the middle of the distal joint of the endopod, with the distal joint a little longer than the proximal.

Length of a female with marsupium 1.94 mm.

Subadult Male. The antennulæ (fig. 3c) considerably thicker than in the female; first joint about two and a half times as long as deep and tapering a little; second joint conspicuously deeper than long; third joint a little thickened below towards the base. — Length 1.9 mm.

Remarks. *T. mixtus* might perhaps be considered a variety of *T. finmarchicus*, but according to my judgment it is a separate species; I have learned by experience that even small characters are not infrequently of specific value. *T. mixtus* differs from *T. finmarchicus* in having the first joint af the antennulæ conspicuously shorter in proportion to the two other joints combined, in having the carpus of the chelipeds less deep in proportion to its length and the movable finger of the chela longer in proportion to the front margin of the hand. — I have been unable to find any difference between

the specimens from 1435 fathoms in the warm area and specimens from depths ranging between 495 and 1060 fathoms in the cold area, and must therefore refer them all to the same species.

Occurrence. *T. mixtus* has been taken by the "Ingolf" at ten deep-sea stations, with a single exception in the cold area.

Davis Strait:	St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 6 spec.	
North of the Færoes:	St. 141: Lat. 63° 22′ N., Long. 6° 58′ W., 679 fm., temp. ÷ 0.6°; 8 spec.	
— - - —	St. 139: Lat. 63° 36′ N., Long. 7° 30′ W., 702 fm., temp. ÷ 0.6°; 8 spec.	
East of Iceland:	St. 102: Lat. 66° 23′ N., Long. 10° 26′ W., 750 fm., temp. ÷ 0.9°; 4 spec.	
North of Iceland:	St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 1 spec.	
— - —	St. 125: Lat. 68° 08′ N., Long. 16° 02′ W., 729 fm., temp. ÷ 0.8°; 6 spec.	
North-East of Iceland:	St. 120: Lat. 67° 29′ N., Long. 11° 32′ W., 885 fm., temp. ÷ 1.0°; 1 spec.	
— - —	St. 119: Lat. 67° 53′ N., Long. 10° 19′ W., 1010 fm., temp. ÷ 1.0°; 17 spec.	
South of Jan Mayen:	St. 118: Lat. 68° 27′ N., Long. 8° 20′ W., 1060 fm., temp. ÷ 1.0°; 4 spec.	
— - - —	St. 117: Lat. 69° 13′ N., Long. 8° 23′ W., 1003 fm., temp. ÷ 1.0°; 13 spec.	

38. **Typhlotanais cornutus** G. O. Sars.

1879. Paratanais cornutus G. O. Sars, Arch. for Math. og Naturv. B. 4, p. 431.
1885. Typhlotanais — G. O. Sars, Norske Nordhavs-Exp., Crust. I, p. 83, Pl. VII, figs. 29—38.
1896. — — G. O. Sars, Account Crust. Norway, Vol. II, p. 24, Pl. XI, fig. 2.

Sars' figures and description in his last-named work are on the whole good, but it may be useful to enumerate a number of features, by the combination of which this species is separated from any other form.

T. cornutus is thicker than most species, being about four and a half times as long as broad. The carapace is a little or somewhat shorter than the three following segments combined. Antennulæ moderately slender, scarcely as long as the carapace, with the longest terminal setæ decidedly longer than the two distal joints combined. Chelipeds with carpus and chela equal in length and somewhat short in proportion to breadth; the movable finger a good deal shorter than the front margin of the hand. — Second thoracic segment half or less than half as long as third segment, which is conspicuously shorter than the fourth. Second pair of thoracic legs somewhat slender; sixth joint conspicuously longer than the seventh with claw, with its distal posterior seta somewhat long. Second joint of the posterior pairs of legs moderately thick. — Uropods with both rami two-jointed and the exopod conspicuously shorter than the endopod.

Among the characters pointed out by Sars that drawn from the well-developed rostrum seems to me less valuable, and it may be stated here that I have some co-types of Sars presented by himself. — In specimens with the ventral side of second thoracic segment convex a moderately small or somewhat large process projects downwards and much forwards, originating somewhat behind the front end of the segment.

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

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 42 spec.

Distribution. According to Sars this species has been taken at Kvalo in the most northern part of Norway (Lat. $70^2/_3°$ N.) "from depths of 60—100 fathoms", and at a locality "about midway between Beeren Eiland and Finmark", from 190 fathoms.

39. **Typhlotanais solidus** n. sp.

(Pl. VI, figs. 4 a—4 f).

Female (without marsupium). Body robust, only a little more than four times as long as broad (fig. 4 a). — Carapace even longer than the three following segments combined, slightly longer than broad (fig. 4 b); the postero-lateral angles broadly rounded, the major part of the lateral margins converging to near the front end, where they are rounded; the front end is scarcely half as broad as the carapace somewhat from its hind margin, and the rostral process is somewhat long, acute.

Antennulæ scarcely as long as the carapace (fig. 4 b), moderately robust. First joint half as long again as the two other joints combined, three and a half times as long as deep (fig. 4 c) and tapering regularly and somewhat feebly; seen from above (fig. 4 b) two and a half times as long as broad and tapering considerably. Second joint about twice as long as deep; third joint rather short, scarcely half as long again as the second, its longest terminal setæ distinctly longer than the two distal joints combined. — Antennæ (fig. 4 c) somewhat long; second and third joints considerably widened above; fourth joint not quite twice as long as the penultimate; longest terminal seta even slightly longer than that of the antennulæ.

Chelipeds (fig. 4 c) rather long but moderately robust. Basal joint with the proximal protuberance large, nearly as long as deep and reaching the front end of second thoracic segment; carpus long, considerably longer than the basal joint and three times as long as deep. Chela a little longer than carpus, three and a half times as long as broad; anterior margin of the hand almost half as long again as the movable finger; fixed finger at the base slightly broader than the movable, with a tooth near the end of the incisive margin.

Thoracic segments (fig. 4 a) increase in length and decrease a little in breadth from second to fifth, decrease in length and increase perceptibly in breadth from fifth to seventh; the lateral margins are very convex on second and third segments, moderately convex on the fourth segment, less convex but more or less distinctly angular towards or near the posterior margin on the three posterior segments. The three anterior segments combined scarcely longer than fifth and sixth segments together. — Anterior pairs of legs somewhat slender and moderately long. Second pair (fig. 4 d) with fifth joint a little longer than the fourth and somewhat shorter and thicker than the sixth, which is a little longer than seventh joint with claw; setæ short or wanting. Third pair only a little shorter than second; sixth joint a little longer than fifth and not fully twice as long as seventh with claw, with the upper distal setæ moderately long. Sixth and seventh pairs (fig. 4 e) considerably shorter than the anterior pairs, somewhat slender; second joint nearly three times as long as broad; fourth and fifth joints a little thickened, respectively with a single spine and two minute distal spines; sixth joint moderately slender and nearly as long as fourth and fifth joints combined; seventh joint very short with the claw minute, both together only about one-third as long as the sixth joint.

Abdomen slightly broader than seventh thoracic segment, as long as seventh, sixth and half of the fifth thoracic segment combined. — Uropods short (fig. 4 f); endopod rather robust, two-jointed, with the proximal joint distinctly longer than the distal; exopod nearly as long as the endopod, but more slender and without any perceptible articulation.

Length of the single specimen 1.85 mm.

Remarks. *T. solidus* is easily distinguished from the other species by its broad body and the shape of the thoracic segments; antennulæ, chelipeds and uropods afford further characters. The animal is yellow, and its exoskeleton seems to be more solid than in any other species of similar size. The specimen has the ventral side of the thoracic segments flat, consequently no ventral process on second segment, and seems to be full-grown.

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

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 1 spec.

Agathotanais n. gen.

Body in the female and subadult male moderately slender, decreasing in breadth from the middle of the carapace to the base of abdomen, which is narrower than the last thoracic segment. Carapace about as long as the two following segments combined. No eyes. Antennulæ in the female three-jointed, with the first joint longer than the two others combined; in the subadult male the third joint has a transverse suture. Antennæ in the female (Pl. VI, fig. 5 c) quite rudimentary, consisting of a minute joint; in the subadult male (fig. 5 n) about as long as the proximal depth of the antennulæ.

Mandibles (fig. 5 d) small, with only the incisive part developed, while a movable lacinia and the molar process are completely wanting. Maxillulæ (fig. 5 f) consist of a single slender joint curved towards both ends; the terminal part has several thick spines and some fine hairs; the palp is only half as long as the joint, slender and very thin-skinned, with two terminal setæ. (Maxillæ not seen, rudimentary or wanting.) Maxillipeds (fig. 5 g) considerably reduced; the two proximal joints and the lobes are completely fused, constituting a circular, vaulted, strongly chitinized plate with a median fissure in its anterior part; the four-jointed palps with the terminal joint slender; the epipods — omitted in the figure — are subtriangular, small, thick plates.

Chelipeds slender. Thoracic legs very slender; second and third pairs completely similar; claw on the three posterior pairs very long (fig. 5 k). Seventh thoracic segment immovably fused with the abdomen and all abdominal segments immovably fused, but all seven segments are limited by moderately distinct, though feeble furrows (figs. 5 b and 5 o). Pleopods wanting in the female (fig. 5 b); in the subadult male (fig. 5 o) they are long, unjointed, slender and somewhat conical and all coalesced, constituting a kind of pyramid with longitudinal impressions between the pairs; each pleopod terminates in a few very short setæ. Uropods rudimentary, each being a small, subtriangular joint without any distinct division (figs. 5 l and 5 m).

The exoskeleton of the animals, excepting the walking legs, has a peculiar aspect and seems

to contain a large quantity of calcium, as it is firm but yet fragile. The walking legs are inserted in small holes in the firm wall of the segments.

Remarks. This genus, founded on some specimens of a single species, is the most aberrant type of the family hitherto discovered. The three most interesting features are: the rudimentary antennæ, the fusion of the last thoracic segment and all abdominal segments in a single portion with feeble furrows indicating the limits between the seven segments, finally the coalescence of all five pairs of long, unjointed pleopods in the subadult male.

In the number of joints in the antennulæ the genus shows affinity to the preceding genera *Paratanais* and *Typhlotanais*, while the similarity of second pair of legs with third pair resembles the features in *Leptognathia* and *Cryptocope*; the reduced mandibles are somewhat similar to those in *Tanaopsis*.

40. **Agathotanais Ingolfi** n. sp.

(Pl. VI, figs. 5a—5o.)

Female (without marsupium). Body about six and a half times as long as broad. — Carapace (fig. 5a) about as long as the two following segments combined, somewhat longer than broad, seen from above ovate, with the lateral margins considerably convex to near the front end which is a little less than half as broad as the base of the carapace and considerably less than half as broad as the carapace a little behind the middle; frontal process somewhat short and obtuse.

Antennulæ a little shorter than the carapace, moderately strong (fig. 5c). First joint considerably longer than the two other joints combined, about three and a half times as long as deep at the base, with the subdistal part as deep as the middle but a little narrowed between these places; seen from above it is distinctly thickened on the outer side both at the middle and near both ends. Second joint short, about half as long again as deep; third joint twice as long as the second, somewhat robust, with the terminal setæ shorter than the joint. — Antennæ consist of a minute conical joint terminating in a few setæ.

Chelipeds (figs. 5b and 5h) slender. Basal joint somewhat longer than deep, without any posterior protuberance, but attached to the cephalothorax by an oblique articulation, and the distance between this articulation and the front lower angle of second thoracic segment is about as long as the joint. Carpus about twice as long as the basal joint, between three and four times as long as deep, with the lower margin undulate. Chela about as long as the carpus, three times as long as broad; movable finger a little longer than the front margin of the hand; fixed finger near the base considerably broader than the movable, with three low, protruding angles on the distal part of the incisive margin.

Thoracic segments (fig. 5a) decrease in breadth from second to seventh. Third segment slightly longer than the second and slightly shorter than the fourth; fifth and sixth segments each somewhat longer than the others; seventh segment as long as second. Second segment not quite as broad as the carapace; broadest a little behind the anterior margin, tapering rapidly to the front angles and considerably to the posterior margin; third segment nearly as the second but its broadest part a little longer from the front end; fourth segment broadest not much before the middle and tapering to both

ends; on the three posterior segments their broadest part is behind the middle and in the seventh somewhat near the posterior margin. The broadest part of each segment has instead of lateral angles a pair of rounded protuberances on which the legs are inserted. — Thoracic legs moderately long and very slender. Second (fig. 5i) and third pairs completely similar (fig. 5b); fifth joint of very moderate length, with a somewhat long seta on the posterior angle; fifth joint very long, much longer than the fourth and slightly shorter than the sixth, with a very long seta from the anterior distal angle; seventh joint and claw equal in length and together somewhat shorter than sixth joint. Three posterior pairs of legs (fig. 5k) with second joint extremely long, about as long as the five following joints and the claw combined; sixth joint slightly longer than the fifth, and both these joints with some terminal spines, two of which are somewhat long; the claw much longer than seventh joint and sometimes even about as long as the sixth joint.

Abdomen somewhat shorter than the two posterior thoracic segments combined; the five segments somewhat narrower than seventh thoracic segment (fig. 5a); the last segment broadly cordiform, conspicuously broader than the preceding segment and as long as two segments combined. — Pleopods and uropods mentioned in the description of the genus.

Length of the largest specimen 3.8 mm.

Subadult Male. The antennulæ (fig. 5n) are much thicker than in the female; first joint about three times as long as deep, and nearly as deep at the end as at the base, but narrower at the middle, as the lower margin of the joint is somewhat concave; second joint considerably deeper than long; third joint divided by a transverse suture a little before the middle and the proximal part marked off in this way much thicker than the distal. Antennæ consist of a single joint about three times as long as in the female, about as long as the depth of first antennular joint at its base. — Abdomen somewhat longer in proportion to the posterior thoracic segments than in the female; the pleopods have been described in the diagnosis of the genus.

Length of a subadult male 3 mm.

Remarks. As to this extremely interesting species it may be sufficient to refer to the remarks on the genus. The animals are completely white.

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

Davis Strait: St. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fm., temp. 2.4°; 1 spec.

Denmark Strait: St. 10: Lat. 64° 24′ N., Long. 28° 50′ W., 788 fm., temp. 3.5°; 8 spec. (3 females, 3 males and 2 young spec.).

South of Iceland: St. 40: Lat. 62°00′ N., Long. 21° 36′ W., 845 fm., temp. 3.3°; 1 spec.

Leptognathia G. O. Sars.

This genus comprises 14 species already established in the literature. In the following pages 25 species are described, 19 of which are considered new to science. The genus is thus very large, comprising 33 species. For reasons mentioned on p. 9, I do not divide it into three or four genera, though it comprises types not only very different in general aspect but also showing considerable

differences in the shape of the molar processes of the mandible, in chelipeds, thoracic legs, pleopods and uropods. But being unable to say anything about the mandibles in several interesting species, because my material is too small, and being in doubt whether some of the characters are only of specific value or ought to be considered of higher importance, I confine myself to dividing the species described or mentioned in this report into four groups and two of these groups into sub-groups. This arrangement may, I hope, not only facilitate the determination of species but besides afford a general view of the relationships of the various species. It may be stated that the divisions are founded exclusively on the females, because in several species the pleopods are rudimentary or wanting in this sex but well developed in the subadult males.

Group a. *Uropods long, with both rami two-jointed and the exopod considerably shorter than the proximal joint of the endopod. Pleopods in the females well developed, biramous, with long setæ. Animals moderately slender or somewhat robust.*

The animals of this division, which may be named the *Sarsii*- or *longiremis*-group, are somewhat uniform in general aspect and allied in several features. Sars' figures of the female of his *L. longiremis* (= *L. Sarsii* H. J. H., not *L. longiremis* Lilljbg.) convey a fair idea of the aspect of the forms of this group. The body is moderately slender. The antennæ are seven-jointed, as fourth and fifth joints are separated by a well developed articulation. The basal joint of the chelipeds have the posterior protuberance well developed, with its posterior margin free and rounded. The thoracic legs are moderately slender, with long or moderately long spines; the three posterior pairs with seventh joint moderately long, considerably or much longer than the claw and both combined as long as or longer than the sixth joint. This group may be divided into three subdivisions.

α. The movable finger of the chelæ serrate along the anterior (upper) margin. Fifth abdominal segment without any hastate process.

Species 41—43.

β. The movable finger of the chelæ without serration along the anterior margin. Fifth abdominal segment without any hastate process.

Species 44—48.

γ. The movable finger of the chelæ without serration along the front margin. Fifth abdominal segment with the ventral protuberance produced in a long acute process directed more or less backwards.

Species 49—51.

Group a, subdivision *α* (vid. above).

41. **Leptognathia multiserrata** n. sp.

(Pl. VI, figs. 6a—6e.)

Female (without marsupium). General aspect as in *L. Sarsii* H. J. H. — Antennulæ slightly more than two-thirds as long as the carapace. First joint nearly longer than the three others combined

(fig. 6a), not fully three times as long as deep, tapering much from somewhat from the base to the end; second joint slightly longer than the depth of the first and considerably produced above; upper margin of third joint only half as long as that of the second; fourth joint scarcely as long as the upper margin of the second. — Antennæ with fifth joint almost half as long again as the fourth, which is slightly longer than the sixth.

Chelipeds (fig. 6b) extremely robust. Carpus a little more than half as long again as deep, with the major distal part considerably expanded downwards and the corresponding part of the lower margin much longer than the proximal portion, considerably convex and with some low, rounded saw-teeth along its proximal part, viz. that situated beyond the usual seta. Chela as long as the carpus, less than twice as long as broad; the distal part of the hand somewhat expanded anteriorly and the corresponding part of the anterior margin very convex and furnished with about six rounded saw-teeth, but without any protruding angle above the insertion of the movable finger. Both fingers thick; the movable finger somewhat shorter than the anterior margin of the hand, with a row of conspicuous, rounded saw-teeth along the major part of the proximal half of the anterior margin; the fixed finger with an oblong, low, subtriangular thickening at the usual setæ on the outer side, and the posterior margin of this thickening has a row of four strong, rounded saw-teeth; the incisive margin of this finger with three very conspicuous, obtuse, moderately low teeth.

Second and third pairs of thoracic legs (fig. 6c) quite similar, rather slender; posterior distal spine of fourth joint even longer than fifth joint; sixth joint about one-third as long again as the fifth and a little longer than seventh with claw. Three posterior pairs of legs (fig. 6d) have the seventh joint somewhat shorter than the sixth and adorned with a close row of extremely small setiform denticles.

The five anterior abdominal segments (fig. 6e) with the median row of ventral protuberances rounded and somewhat low, seemingly not strongly chitinized. Pleopods with the marginal setæ more than twice as long as the rami. Terminal segment with the sides evenly rounded. — Uropods about as long as the sixth plus half of the fifth abdominal segment (fig. 6e); the peduncle more than twice as long as deep and more than half as long as the first joint of the endopod; first joint of the endopod slightly longer than the second; exopod half as long as the first joint of the endopod.

Length of the single full-grown or nearly full-grown female without marsupium 3.5 mm.

Remarks. This species is easily distinguished by having carpus and chela of the chelipeds proportionately broader than in any other species of this subdivision and besides by the peculiar shape of the chela with the rounded teeth at the posterior margin. — It may be added that the other specimen, which is so young, that seventh pair of thoracic legs are still wanting, has the carpus and the hand of the chelæ less expanded but showing all the characteristic crenulations.

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

East of Iceland: St. 4: Lat. 64°07′ N., Long. 11°12′ W., 237 fm., temp. 2.5°; 2 spec.

42. **Leptognathia Sarsii** H. J. Hansen.
(Pl. VI, figs. 7a—7f.)

1909. *Leptognathia Sarsii* H. J. Hansen, Vidensk. Medd. Naturh. Forening i Kjobenhavn for 1909, p. 229[1]).

1896. — *longiremis* G. O. Sars, Account Crust. Norway, Vol. II, p. 27, Pl. XII (Not *Tanais longiremis* Lilljeborg).

Female. — Antennulæ nearly three-fourths as long as the carapace. First joint about as long as the three others combined (fig. 7a), scarcely two and a half times as long as deep, tapering considerably from the base to the end; second joint slightly longer than the depth of the first and somewhat produced above; third joint about half as long as the second; fourth joint distinctly shorter than the upper margin of the second. — Antennæ with fifth joint a little more than half as long again as the fourth, which is slightly longer than the sixth.

Chelipeds (figs. 7a and 7b) very robust. Carpus only about half as long again as deep, its distal half somewhat expanded downwards, but the convex lower margin of that part without crenulation. Chela a little longer than the carpus, twice as long as broad, somewhat triangular in outline; the distal part of the anterior margin slightly convex and furnished with some four to seven sharp or rounded, small saw-teeth; the terminal corner above the insertion of the movable finger is somewhat protruding, about rectangular. The outer side of the chela has a row of eight or nine protruding teeth situated nearly parallel with and a little removed from the posterior margin, the row beginning with the strongest tooth somewhat near the distal setæ of the posterior margin and going upwards on the hand where the teeth are gradually smaller and finally disappear. Half or more than half of the anterior margin of the movable finger is crenulate, with a number of either sharp and triangular or rounded saw-teeth, the finger itself somewhat shorter than the anterior margin of the hand. The subdistal part of the incisive margin of the fixed finger with three sharp saw-teeth, the distal tooth subdivided into two teeth.

The thoracic legs somewhat slender. Second (fig. 7c) and third pairs subequal; posterior terminal spine on fourth joint conspicuously shorter than fifth joint; sixth joint almost or fully half as long again as the fifth, slightly or distinctly shorter than the seventh with claw. Three posterior pairs of legs have the seventh joint (fig. 7d) somewhat shorter than the sixth and furnished with an either distinct or nearly indistinct row of minute, setiform denticles.

Five anterior abdominal segments with the ventral tubercles high and strong (fig. 7e). Pleopods with the marginal setæ between half as long again and twice as long as the rami. Sixth abdominal segment (figs. 7e and 7f) with the lateral plate on each side produced downwards in a keel which generally projects in a very conspicuous, obliquely triangular, acute process directed downwards and backwards, but in some specimens (from four localities in Greenland) these processes are shorter and obtuse or very short and broadly rounded, but a protrusion is always distinct. — The uropods as long as the sixth and half of the fifth segment combined; the peduncle a little or somewhat less than twice as long as deep, but slightly more than half as long as the first joint of the endopod, which is

[1]) In a foot-note in his Arctic Crustacea I (Bihang Kgl. Sv. Vet. Akad. Handlingar, B. 26, Afd. IV, No 12, 1901) Ohlin stated that I had proposed the name *L. Sarsii* for this species.

conspicuously longer than the second joint; the exopod more than half as long as the proximal joint of the endopod.

Length of the largest specimen, a female with marsupium from the Sabine Island, is 5 mm long, but the majority of the females are only 3.5—4 mm.

Subadult Male. Antennulæ considerably thicker than in the female, five-jointed, the proximal third of the fourth joint being set off by an articulation and somewhat thickened; first joint somewhat shorter than the other joints combined, thick to the end; second joint scarcely as thick as the first and third joint rather thick. Abdomen distinctly a little longer and thicker in proportion to thorax than in the female. — Length 2.6—2.7 mm.

Adult Male. Not seen by me, but I suppose that the adult male described and figured by Sars as belonging to his *L. longiremis* is the male of *L. Sarsii*. It has the two proximal joints of the antennulæ extremely broad and the chelæ uncommonly slender, while the thoracic legs have the sixth joint longer than seventh joint with claw.

Remarks. *L. Sarsii* is easily recognized from the other species by the rounded protruding keel or generally triangular process on the lower lateral surface of last abdominal segment and by the row of saw-teeth on the outer side of the chela a little from its posterior margin. In the shape of the hand and the crenulation of the movable finger it agrees with *L. gracilis* Kröyer and *L. graciloides* Lilljeborg. The form with the obtuse process or rounded lateral keel I name var. *obtusata;* it is certainly only a variety, as my material from the Sabine Island contains both specimens with the processes obtuse or much reduced. That *L. Sarsii* is identical with *L. longiremis* G. O. Sars as described and figured in his standard work is easily seen by the pair of processes on last abdominal segment. That the real *L. longiremis* Lilljeborg is another species is easily decided by two characters found in Lilljeborg's diagnosis of the female: "Manus... digito mobili lævi" and "Unguis pedum thor. 2:di paris brevis, et articulo unguifero multo brevior." This last-named species is described below.

Occurrence. The "Ingolf" has found this species at three stations.

North of Iceland: St. 128: Lat. 66° 50′ N., Long. 20° 02′ W., 194 fm., temp. 0.6°; 1 spec.
— - — St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 7 spec.
— - — St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 4 spec.

Besides *L. Sarsii* has been taken by various Zoologists and the II[d] Amdrup-Expedition at a good number of localities.

West-Greenland, probably Egedesminde; 1 spec. (var. *obtusata*). Prof. D. Bergendal.
Færoes: Klaksvig, 10—15 fm.; about 70 spec. Dr. T. Mortensen.
East Iceland: Breidals Vig, 6 fm., mud and black sand; 28 spec. Dr. A. C. Johansen.
— — Seydis Fjord, 6 fm., black sand; 6 spec. Dr. A. C. Johansen.
— — Bakke Fjord, 8—10 fm., black sand; 9 spec. Dr. A. C. Johansen.
East Greenland: Angmagsalik, Lat. 65° 51′ N.; 4 spec. (var. *obtusata*). Mag. Krunse.
— — Cape Dalton, Lat. 69° 24.6′ N., 9—11 fm.; 4 spec. II[d] Amdrup Exped.
— — Turner Sound, Lat. 69° 44′ N., 3 fm.; 1 spec. (var. *obtusata*). II[d] Amdrup Exped.
— — North of Stewart Land (about at Lat. 70½° N.), 158 fm.; 2 spec. II[d] Amdrup Exped.

East Greenland: Sabine Island, about at Lat. $74^{1}/_{3}°$ N., 3—5 fm.; 15 spec. (the majority belonging to var. *obtusata*). II[d] Amdrup Exped.

Finally two specimens mentioned by Ohlin (1901) probably belong to this species; they were taken at the two following localities.

East Greenland: Lat. 74° 35′ N., Long. 18° 23′ W., 18—21 m., sandy mud; 1 spec.

— — Lat. 77° 9′ N., Long. 14° 40′ E, 90 m., soft grey clay; 1 spec.

Distribution. In the work quoted Sars has stated on his *L. longiremis:* "This species occurs along the whole Norwegian coast, from Christrianiafjord to Vadso in depths ranging from 30 to 100 fathoms". Sars has presented the Copenhagen Museum with 25 specimens which must be considered co-types of his *L. longiremis*, but only 13 of these specimens show the characteristic shape of sixth abdominal segment and belong consequently to *L. Sarsii* H. J. H., while 4 specimens belong to *L. gracilis* Kr. as interpreted below and 8 specimens must be referred to the real *L. longiremis* Liljeborg. The result is that Sars' utterances on the occurrence of his *L. longiremis* along the whole Norwegian coast are valueless, but it remains certain that *L. Sarsii* has been taken at Norway, and I suppose only at the Finmark, because all above-named localities, where this species has been captured by Danish or Swedish explorers, have an arctic character.

43. **Leptognathia gracilis** Kroyer.

(Pl. VII, figs. 1 a—1 d).

1847. *Tanais gracilis* Kröyer, Naturh. Tidsskr. 2. R. B. II, p. 408.

? — — Kröyer, Voy. en Scand. Crust. Pl. 31, fig. 4, a—i.

1877. — *islandicus* G. O. Sars, Arch. for Math. og Naturv. B. II, p. 346.

1885. *Leptognathia longiremis* G. O. Sars, Norske Nordhavs-Exped., Crust. I, p. 79, Pl. 7, figs. 17—27.

Female. This species is so closely allied to *L. Sarsii* that it may be sufficient to point out the differences and make mention of some features. — The antennulæ (fig. 1 a) a little more slender than in *L. Sarsii;* first joint distinctly more than two and a half times as long as deep, somewhat tapering and as long as the three other joints combined; second joint conspicuously longer than the depth of the first, somewhat produced above; upper margin of third joint about half as long as that of the second; fourth joint nearly as long as the second. — Antennæ as in *L. Sarsii.*

Chelipeds (figs. 1 a and 1 b) scarcely as robust as in *L. Sarsii;* carpus only a little less than twice as long as deep. Chela slightly longer than carpus, nearly twice as long as broad, somewhat triangular in aspect; the hand is less or more protruding and angular above the insertion of the movable finger, and the crenulation on the distal part of the anterior margin is distinct or rudimentary; the outer side of the chela has no row of small tubercles as in *L. Sarsii,* while a longer or shorter part of the front margin of the movable finger is distinctly crenulate.

Second and third pairs of thoracic legs subequal; posterior terminal spine of fourth joint considerably shorter than fifth joint (fig. 1 c); sixth joint not quite half as long again as the fifth; seventh joint with claw a little or conspicuously longer than the sixth joint.

Abdominal segments as in *L. Sarsii* excepting that the sixth segment has no trace of any pro-

truding lateral process or keel. — Uropods (fig. 1 d) in the main as in *L. Sarsii:* peduncle about twice as long as deep, a little more than half as long as first joint of the endopod, and this joint is somewhat longer than the second; exopod scarcely more than half as long as the proximal joint of the endopod.

Length of a female without marsupium from Greenland 3.2 mm; an ovigerous female from Norway is 2.2 mm long.

Remarks. This species is, in my opinion, well separated from *L. Sarsii* by the absence of a row of teeth on the outer side of the chela and by having the last abdominal segment simple, without any acute or rounded lateral process.

In the revised list of the Danish species of most orders of Malacostraca (1909) I referred *L. graciloides* Lilljeborg to *L. gracilis* Kr. Having re-examined the Danish specimens I prefer now to refer them to *L. graciloides* which is re-established as a species closely allied to *L. Sarsii* and *L. gracilis*. *L. graciloides* agrees with *L. Sarsii* in having a row of tubercles on the outer side of the chela, but the anterior margin of the movable finger has only about five sharp saw-teeth, and the last abdominal segment has, as in *L. gracilis*, no trace of a lateral process; it differs from *L. gracilis* in possessing the row of tubercles on the outer side of the chela, and the carpus of the chelipeds has the distal half more expanded downwards, so that the lower margin of the carpus is at the middle considerably more incised as in *L. gracilis* and even more than in the figure of *L. Sarsii* (Pl. VI, fig. 7a); finally the uropods have the exopod considerably more than half as long as the first joint of the endopod. Length of the Danish specimens, among which a couple of ovigerous females, 2.2—2.5 mm.

As to Kröyer's specimen and description I refer to my remarks (p. 230—31) in the paper on the Danish fauna; it is clear that my application of the Kröyerian name is not quite certain, but I have used it, as I did not like to cancel it.

Occurrence. This species has been captured by the "Ingolf" at a single locality.

West-Greenland: Ameragdla (inner end of Ameralik Fjord, near Godthaab), muddy bottom, 11 spec. (some of them young).

According to Sars his specimens of *L. islandicus* or (in 1885) *L. longiremis,* which seem to belong to *L. gracilis*, were taken at Iceland, harbour of Reykjavik.

Distribution. As already mentioned, I found a few specimens of *L. gracilis* between co-types of *L. longiremis* given by G. O. Sars and taken at Norway. The Copenhagen Museum possesses 3 small specimens from the Kara Sea, 50 fathoms. Kroyer's specimen was from Spitzbergen. Specimens taken in the deep water off Aberdeen and in the Moray Firth were determined by Th. Scott as *L. (?) longiremis* Lilljeb., but according to his description and figures the specimens probably belong to *L. gracilis.*

Group a, subdivision β (vid. p. 66).

44. **Leptognathia Hanseni** Vanhöffen

(Pl. VII, figs. 2a—2l).

1907. *Leptognathia hanseni* Vanhöffen, Zool. Jahrb., Abth. für System. Bd. XXV, p. 513, Taf. 20, Fig. 13—15.

Female. General aspect about as in *L. gracilis.* — Antennulæ (fig. 2a) on the whole a little

more robust. First joint a little longer than the three other joints combined, a little more than two and a half times as long as deep, moderately tapering; second joint about as long as the depth of first joint, moderately produced above and somewhat thick; upper margin of third joint half or more than half as long as the second; fourth joint decidedly shorter than the second. — Antennæ with fourth joint scarcely half as long again as the fifth, as long as or shorter than the sixth.

Chelipeds (figs. 2a and 2e) somewhat robust; carpus a little or somewhat less than twice as long as deep, with the distal half distinctly expanded downwards and the corresponding part of the lower margin moderately convex. Chela slightly or a little longer than the carpus, somewhat more than twice as long as broad, thus conspicuously less broad than in the three preceding species; the hand is oblong but not subtriangular, its anterior margin without crenulation and about half as long again as the movable finger, the distal part above the insertion of the finger flatly rounded or obtuse. The margin of the movable finger and the outer side of the chela without crenulation. The fixed finger with three teeth along the distal portion of the incisive margin and the last tooth cleft.

The thoracic legs moderately slender. Second and third pairs subequal (fig. 2b); posterior terminal spine of fourth joint much shorter than fifth joint; sixth joint about half as long again as the fifth, but a little or very conspicuously shorter than seventh joint with claw. Posterior pairs (fig. 2c) with the sixth joint about half as long again as the seventh, which has a row of very fine and short, setiform denticles.

The five anterior abdominal segments (fig. 2d) with the median row of ventral tubercles high and strong; lateral plates of sixth segment without any expansion or process. The pleopods with the setæ about twice as long as the rami. — Uropods about as long as the two posterior segments combined; the peduncle nearly twice as long as deep, more than half as long as first joint of the endopod; second joint of the endopod conspicuously or even considerably shorter than the first; exopod a little more than half as long as the first joint of the endopod.

Length of a large female without marsupium 3.3 mm, of a female with marsupium 2.1 mm.

Subadalt Male. Antennulæ much thicker than in the female, five-jointed, the proximal third of fourth joint being set off by an articulation and somewhat thickened; the first joint is thick to the end, second almost as thick as the first, and third joint rather thick. Abdomen a little longer and distinctly thicker than in the female.

Adult Male (figs. 2f—2l). This description is based on the single "Ingolf" specimen; Vanhöffen's specimen is mentioned in "Remarks". — Antennulæ with first and second joints very thick (fig. 2f); second joint is somewhat more than half as long as the first and slightly longer than the seventh, which is a little longer than the sixth; bundles of sensory setæ originate from the lower distal end of fourth, fifth and sixth joints.

Chelipeds (figs. 2f—2h) somewhat robust; carpus scarcely half as long again as deep. Chela not fully half as long again as the carpus, slightly more than twice as long as broad and nearly as broad as the depth of the carpus; anterior margin of the hand nearly half as long again as the movable finger, which has its incisive margin irregularly serrate from the base to the middle, while the corresponding margin of the fixed finger is somewhat convex and very finely serrate along nearly

three-fourths of its length; the inner side of the hand (fig. 2h) with a subdistal, transverse row of peculiar light but broad setæ.

Second pair of thoracic legs (fig. 2i) thinner than in the female, with the sixth joint scarcely half as long again as the fourth and as long as seventh with claw. Three posterior pairs of legs (fig. 2k) with sixth joint somewhat longer than the fifth and slightly shorter than the seventh, which is about two and a half times as long as the claw.

Sixth abdominal segment (fig. 2l) posteriorly produced into a small, rounded tip. — Endopod of the uropods somewhat longer than the exopod, two-jointed, with the first joint a little longer and considerably thicker than the second, before the middle on the upper half of the outer side with some fine hairs placed in a transverse row.

Length of the specimen 1.3 mm.

Remarks. *L. Hanseni* is sharply separated from the three preceding species by the more oblong chelæ without any serration on the anterior margin of hand or finger; from *L. longiremis* Lilljeborg and *L. inermis* n. sp. it is easily distinguished by the much longer "claw" (seventh joint plus claw) on second and third pairs of legs. As to the male described, which is easily seen to belong to *Leptognathia*, I am sure that it belongs to the female, because it has been taken together with a large number of females and immature males and cannot belong to any other species known from West Greenland excepting *L. Sarsii* and *L. gracilis*, but no female of any of these species has been taken at Ameralik, and the male described by Sars as belonging to his *L. longiremis* probably belongs to *L. Sarsii* and differs widely in some features.

Then the determination of the present species. In the paper on the marine Malacostraca of West Greenland (1887) I mentioned a specimen which did not agree with *L. longiremis* as interpreted and figured by Sars in the Norwegian North-Atlantic Expedition, because the chelæ had no serration; I named it "?*Leptognathia longiremis* Lilljeborg" and added figures of antenna, chela and uropod. According to these figures the specimen (which belongs to the Riks Museum in Stockholm) is certainly identical with the species described here as *L. Hanseni* Vanh. Later Vanhöffen captured several specimens of a species in Karajok Fjord (not very far from Kekertak); he found that his females agreed with my remarks and figures and finding no positive facts which made it necessary to refer the form to the real *L. longiremis* Lilljeborg, he named it *L. hanseni*, described and figured the male but unfortunately not the more important female. As his male differs from my above-described specimen in a couple of features to be discussed presently, I asked Dr. Vanhöffen to lend me a few specimens; I received the whole material, six females and an adult male, and I beg the Direction of the Berlin Museum and Dr. Vanhöffen to accept my sincere thanks. The females captured by Dr. Vanhöffen agree perfectly with my specimens from other localities, but the male must be mentioned separately.

Dr. Vanhöffen's specimen is 1.5 mm, thus distinctly a little larger than mine. He figured the endopod of the uropod as three-jointed, but it is in reality only two-jointed, as no articulation is found at the base of the transverse row of fine hairs. His figure of the chela does not agree completely with my specimen, but an examination of his specimen, which has both chelæ closed and the finer structure of the incisive margins somewhat indistinct, does not reveal any real difference worth men-

tioning. In his specimen the posterior legs have the seventh joint a little shorter and the claw longer (viz. half as long as seventh joint) than in my specimen. The only important difference between the two specimens is that in the antennulæ the seventh joint is considerably or rather much shorter than the sixth in Vanhöffen's specimen, a little longer than the sixth in my specimen. But in spite of this difference, I think that both males belong to the same species. In males of *Leptognathia breviremis* I have observed a conspicuous variation in the length of seventh antennular joint. The female of *L. longiremis* is allied to *L. Hanseni*, but the male of *L. longiremis* differs strongly from that of *L. Hanseni* in the armature of the chelæ and the extreme length of seventh joint with claw on the posterior pairs of thoracic legs (vid. Lilljeborg and my figures published in 1910). The male figured by Sars as belonging to his *L. longiremis* differs also widely from that of *L. Hanseni*. Consequently I am induced to think that the specific differences between males of different species of this group *a* are much larger than between Vanhöffen's specimen and my own, and that the differences observed between these two specimens are due only to variation.

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

West Greenland: Mouth of Ameralik Fjord, near Godthaab, 5—70 fm., shells; more than a hundred females and immature males, and one adult male.

L. Hanseni has besides been taken at several other places in Greenland by various Zoologists.

West Greenland: Karajok Fjord, ab. Lat. 70° 20′ N.; several spec. Dr. E. Vanhöffen.

— — Kekertak, Lat. 69° 58′ N., 35—40 fm., clay; 1 spec. Nordenskjöld Exped. 1870.

East Greenland: Angmagsalik, ab. Lat. 65½°; 2 spec. Mag. Kruuse.

— — — 4—11 fm.; 2 spec. Ryder Exped.

— — Tasiusak, Lat. 65° 37′ N., 20—30 fm., stones with algæ; 1 spec. I[st] Amdrup Expedition.

— — Cape Dalton, Lat. 69° 24.6′ N., 9—11 fm.; 2 spec. II[d] Amdrup Exped.

— — Denmark Island, Lat. 70° 27′ N.; 1 spec. Ryder Exped.

The species is hitherto only known from Greenland.

45. **Leptognathia longiremis** Lilljeborg.

(Pl. VII; figs. 3a—3e.)

1864. *Tanais longiremis* Lilljeborg, Bidrag till kännedomen om de inom Sverige och Norrige förek. Crust. af ... Tanaidernas familj, p. 19 (Female and adult male).

1910. *Leptognathia longiremis* H. J. Hansen, Vidensk. Medd. Naturh. Forening i Kjobenhavn for 1909, p. 229, Pl. V, figs. 3a—3b.

Female. General aspect as *L. Hanseni*. — Antennulæ (fig. 3a) moderately strong. First joint a little longer than the three other joints combined, somewhat less than three times as long as deep, moderately tapering; second joint slightly longer than the depth of first joint, considerably produced above and somewhat thick; upper margin of third joint less than half as long as that of the second; fourth joint a little shorter than the second. — Antennæ as in *L. Hanseni*.

Chelipeds (fig. 3a) nearly as in *L. Hanseni*; carpus a little less than twice as long as deep;

the distal half somewhat expanded downwards with its lower margin oblique or distally nearly angular. Chela a little longer than the carpus and somewhat more than twice as long as broad, without any serration excepting the four teeth on the distal half of the incisive margin of the movable finger; the anterior margin of the hand considerably longer than the movable finger and its distal part above the insertion of the finger rounded.

The thoracic legs are rather slender. Second and third pairs similar (fig. 3b); spine on the posterior angle of fourth joint somewhat shorter than fifth joint, which is at least more than twice as long as broad; sixth joint nearly half as long again as the fifth and somewhat or considerably longer than seventh joint with claw. Three posterior pairs with sixth joint as long as or slightly longer than seventh joint with claw (fig. 3c); the row of minute denticles on seventh joint scarcely distinct.

Five anterior abdominal segments (fig. 3d) with the ventral tubercles high and strong as in *L. Hanseni*; lateral plates of sixth segment without any expansion or process. Pleopods with their setæ very long, about three times as long as the rami. — Uropods (figs. 3d and 3e) somewhat shorter than the two preceding segments combined; peduncle not fully twice as long as deep, conspicuously more than half as long as the first joint of the endopod; the last-named joint from slightly longer to a little shorter than the second joint; exopod distinctly more than half as long as first joint of the endopod.

Length of a fine female without marsupium 2.9 mm, a female with marsupium is 2.8 mm. (Females with marsupium from Norway vary from 2.4 mm to 3.2 mm in length.)

Subadult Male. The differences between this animal and the female completely as in *L. Hanseni*.

Adult Male. This sex has been described by Lilljeborg, and in the above-named paper I published a couple of analytical figures. I have only seen the single Danish specimen.

Remarks. In the oblong chelæ without any serration *L. longiremis* agrees with *L. Hanseni* and differs sharply from the three other preceding species; by having seventh joint with claw of second and third pairs of thoracic legs conspicuously shorter than sixth joint it differs from *L. Hanseni*, while it is easily separated from *L. inermis* by the ventral row of well developed tubercles on the five anterior abdominal segments, by much larger difference between the length of the two proximal antennular joints, etc. That this species is the real *L. longiremis* has been pointed out by me in 1910; especially Lilljeborg's above-quoted description in his Latin diagnosis of second pair of legs together with his statement on the chela: "digito mobili lævi" proves the correctness of my interpretation.

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

Davis Strait:	St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; 17 spec.
South-West of Iceland:	St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 8 spec.
East of Iceland:	St. 4: Lat. 64° 07′ N., Long. 11° 12′ W., 237 fm., temp. 2.5°; 2 spec.
North-East of Iceland:	St. 120: Lat. 67° 29′ N., Long. 11° 32′ W., 885 fm., temp. ÷ 1.0°; 4 spec.
— - —	St. 119: Lat. 67° 53′ N., Long. 10° 19′ W., 1010 fm., temp. ÷ 1,0°; 6 spec.

Furthermore it has been taken by the II[d] Amdrup Expedition at a single locality.

Jan Mayen, 55 fm.; 2 spec.

Distribution. Lilljeborg examined specimens taken off Bohuslän and at Molde (west coast of Norway at Lat. 62°42′ N.). Material from Norway determined by Sars contained, as already stated, several specimens of this species together with two other species. In 1910 I enumerated two localities in Skager Rak, 110 and 125 fm., and one locality in Kattegat, 20 fm. — All other localities for *L. longiremis* mentioned in the literature ought to be discarded as doubtful or erroneous, and the material in question re-examined by the aid of the present paper.

46. **Leptognathia inermis** n. sp.

(Pl. VII, figs. 4a—4g.)

Female. The antennulæ (fig. 4a) differ conspicuously from those in the preceding forms. First joint is robust, considerably shorter than the three other joints combined, only twice as long as deep and somewhat tapering; second joint is thick and long, with its upper margin somewhat longer than the depth of the first joint and it is somewhat produced above; third joint with its upper margin not fully half as long as the second; fourth joint somewhat shorter than the second. — Antennæ with fifth joint more than half as long again as the fourth, which is distinctly shorter than the sixth.

Chelipeds (figs. 4a and 4b) robust. Carpus extremely deep, only about half as long again as deep, with the distal half conspicuously or, generally, strongly expanded downwards and the corresponding part of the lower margin very convex, nearly semicircular. Chela as long as or a little longer than the carpus, from slightly more to distinctly less than twice as long as broad, thus rather broad, with the distal anterior corner of the hand at the insertion of the movable finger angular and frequently protruding, subrectangular or even with a subacute angle; movable finger uncommonly broad towards the base; with the anterior margin glabrous excepting in a single immature specimen (from East Greenland) which has nearly half of this margin sinuate, with three impressions (fig. 4g); fixed finger with three teeth on the distal part of the incisive margin, but these teeth are frequently obtuse and one or two among them poorly developed.

The thoracic legs are somewhat shorter and thicker than in the five preceding species. Second and third pairs subsimilar (figs. 4c and 4d); the spine from the distal posterior angle of fourth joint very long, from a little longer to somewhat shorter than fifth joint; the last-named joint varies considerably in breadth, being sometimes twice as long as broad, but most frequently broader, even only somewhat longer than broad, with the posterior margin straight or with a couple of low serrations; (perhaps the extreme breadth is due to compression originating from the influence of alcohol); sixth joint considerably longer than, sometimes even half or slightly more than half as long again as, the fifth and always considerably longer than seventh joint with claw. Posterior pairs of legs (fig. 4e) with sixth joint about as long as seventh plus the short claw; seventh joint with the row of minute setiform denticles more or less distinct.

Five anterior abdominal segments (fig. 4f) without any ventral median row of real tubercles, as the lower median margin of each segment is, seen from the side, rather flatly convex. Pleopods as in *L. longiremis*. Sixth abdominal segment, seen from the side (fig. 4f), generally, and in full-grown specimens probably always, more flatly convex than in all preceding species. — Uropods longer than

the two posterior abdominal segments combined; peduncle somewhat or considerably less than twice as long as deep, about half as long as the first joint of the endopod; second joint of the endopod slightly or a little shorter than the first; exopod distinctly more than half as long as first joint of the endopod.

Length of a large female without marsupium 2.8 mm, of a female with marsupium 2.15 mm.

Subadult Male. Antennulæ only four-jointed, but the two proximal joints are considerably, the third joint somewhat, thicker than in the female. The abdomen proportionately somewhat longer and thicker than in the female. — Length 2.1—2.3 mm.

Remarks. *L. inermis* differs from all preceding species of this genus by having the first antennular joint shorter in proportion to its depth and to the length of second joint; in this respect it agrees with some of the following species. From *L. longiremis*, with which it agrees in having seventh joint with claw of second and third pairs of legs conspicuously shorter than sixth joint, it differs in the antennulæ, in having no ventral abdominal tubercles, shorter and stouter legs, the chela broader, etc.

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

East of Iceland: St. 58: Lat. 64° 25′ N., Long. 12° 09′ W., 211 fm., temp. 0.8°; 1 spec.
— - — St. 101: Lat. 66° 23′ N., Long. 12° 05′ W., 537 fm., temp. ÷ 0.7°; 7 spec.
North of Iceland: St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 1 spec.
— - — St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 1 spec.
Jan Mayen: St. 115: Lat. 70° 50′ N., Long. 8° 29′ W., 86 fm., temp. 0.1; ab. 75 spec.

Besides it has been secured by the II[d] Amdrup Exped. at a single locality.

East Greenland: Cape Dalton, Lat. 69° 24.6′ N., 9—11 fm.; 1 spec. (The chelæ of this specimen has the anterior margin of the movable finger sinuate (fig. 4g)).

47. **Leptognathia brachiata** n. sp.

(Pl. VII, figs. 5a—5h.)

Female. Antennulæ two-thirds as long as the carapace (figs. 5a—5b). First joint (fig. 5c) robust, somewhat longer than the three other joints combined, a little more than twice as long as thick, moderately tapering; second joint stout, a little produced above, with the upper margin somewhat longer than the depth of first joint and a little more than half as long as that joint; third joint with the upper margin a little less than half as long as that of the second; fourth joint proportionately short, considerably shorter than the second. — Antennæ with fifth joint about half as long again as the fourth, which is a little shorter than the sixth.

Chelipeds (fig. 5d) moderately robust. Carpus somewhat less than twice as long as deep, with less than the distal half much expanded downwards, the corresponding lower margin being strongly convex and almost subangular. Chela a little shorter than the carpus, a little more than twice as long as broad, without any serration; anterior margin of the hand a little longer than the movable finger, with the lower angle above the insertion of the finger scarcely rounded; movable finger of moderate breadth; fixed finger with three acute saw-teeth on the distal part of the incisive margin.

Thoracic legs rather slender. Second and third pairs subsimilar (fig. 5e); posterior spine on fourth joint as long as fifth joint, which has two long distal spines; sixth joint about half as long again as the fifth and somewhat longer than seventh with claw. Three posterior pairs (fig. 5f) with seventh joint only a little shorter than the sixth and its row of minute setiform denticles rather distinct; claw somewhat long, longer than in the preceding forms.

Five anterior abdominal segments feebly developed or scarcely distinct, the lower margin of the segments being somewhat flatly convex (fig. 5h). Pleopods with long setæ. — Uropods distinctly longer than the two posterior segments combined and longer than in any other species of this genus (figs. 5g and 5h), as the peduncle is very long, almost four times as long as deep and about as long as the first joint of the endopod; second joint of the endopod slightly longer than the first joint; exopod from slightly less to slightly more than half as long as first joint of the endopod.

Length of a female with marsupium 3.3 mm.

Remarks. This fine species is easily distinguished from all other forms of the genus known to me by the very long peduncles of the uropods.

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

Davis Strait: St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; 11 spec.

— — St. 24: Lat. 63° 06′ N., Long. 56° 00′ W., 1199 fm., temp. 2.4°; 6 spec.

The marsupium of one of the females from Stat. 25 contains two ovisacs of an unknown species of the family Choniostomatidæ. It is, I believe, the first time that the existence of a species of this family of parasitic Copepods has been observed in any form of the order Tanaidacea.

48. **Leptognathia alba** n. sp.

(Pl. VII, figs. 6a—6e.)

Specimen without marsupium. The single specimen is either a female without marsupium or, judging from the thick antennulæ, more probably a male so far from maturity, that the fourth antennular joint has not been divided into two joints. The body is conspicuously more robust than in the preceding forms.

Antennulæ (fig. 6a) slightly more than two-thirds as long as the carapace, very robust. First joint slightly longer than the three other joints combined, not fully two and a half times as long as deep and tapering feebly; second joint thick, as long as the depth of the first and somewhat produced above; upper margin of third joint only about one-third as long as that of the second; fourth joint somewhat shorter than the second. — Antennæ with fifth joint scarcely half as long again as the fourth, which is as long as the sixth.

Chelipeds (fig. 6b) moderately robust. Carpus somewhat more than twice as long as deep, with the proximal half of the upper margin somewhat concave; the distal half is feebly expanded downwards. Chela somewhat shorter than the carpus, somewhat more than twice as long as broad, oblong-triangular in aspect, without serration; the anterior distal corner of the hand not rounded; the movable finger somewhat broad and somewhat shorter than the anterior margin of the hand.

Thoracic legs somewhat slender. Second and third pairs subequal (fig. 6c); posterior spine on

fourth joint distinctly longer than fifth joint; distal spines on fifth joint uncommonly long; sixth joint not fully half as long again as the fifth; seventh joint with claw scarcely longer than fifth joint. Three posterior pairs (fig. d) with sixth joint almost as long as seventh with claw; setiform denticles on seventh joint nearly inconspicuous; claw proportionately long.

Five anterior abdominal segments with the median ventral tubercles peculiarly shaped (fig. 6 e), as each tubercle, seen from the side, is somewhat low, because its lower margin is concave instead of convex. Pleopods with their marginal setæ about three times as long as the rami. — Uropods a little longer than the two posterior segments combined; peduncle about half as long again as deep, only half as long as the first joint of the endopod; second joint of the endopod slightly longer than the first; exopod about half as long as the proximal joint of the endopod.

The specimen is 3.7^{mm} long; it is quite white.

Remarks. *L. alba* is easily distinguished from all above-described species by the shape of the ventral abdominal tubercles; the shape of the joints of the chelipeds also affords good characters. The species is uncommonly robust.

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

South-West of Cape Farewell: St. 22: Lat. 58° 10′ N., Long. 48° 25′ W., 1845 fm., temp. 1.4°; 1 spec.

Group a, subdivision γ (vid. p. 66).

49. **Leptognathia hastata** n. sp.

(Pl. VII, figs. 7 a—7 g.)

Female (without marsupium). Antennulæ somewhat or a little shorter than the carapace. First joint (fig. 7 a) a little shorter than the three other joints combined, somewhat more than twice as long as deep and considerably tapering; second joint thick and long, a little more than half as long as the first and somewhat produced above; upper margin of third joint a little less than half as long as that of the second; fourth joint somewhat shorter than the second. — Antennæ with fifth joint slightly more than half as long again as the fourth, which is as long as the sixth.

Chelipeds (fig. 7 b) rather robust. Carpus only about, or even less than, half as long again as deep, with the distal part strongly expanded downwards and the corresponding lower margin very convex. Chela a little longer than the carpus, about twice as long as broad, without serration; hand with the distal anterior corner subrectangular and protruding; movable finger somewhat broad, a little shorter than the anterior margin of the hand; fixed finger with the usual teeth on the incisive margin.

Thoracic legs moderately strong. Second and third pairs subequal (fig. 7 c); posterior distal spine on fourth joint a little longer than the fifth joint; sixth joint about half as long again as the fifth and its lower margin with a more or less distinct row of small denticles; seventh joint with claw slightly longer than fifth joint. Three posterior pairs (fig. 7 d) have seventh joint considerably shorter than the sixth and the row of setiform denticles is very conspicuous (fig. 7 e), the denticles being conspicuously longer than in the preceding forms; claw somewhat more than half as long as seventh joint.

The two anterior abdominal segments with the ventral tubercles wanting or rudimentary; third and fourth segments with the tubercles either rudimentary or rather low and triangular; fifth segment (fig. 7 h) with the tubercle high and posteriorly produced into a very long, acute process projecting horizontally backwards and reaching the middle of sixth segment; in a single specimen (from Stat. 102) the tubercle of fifth segment is rudimentary with the process very short, being undeveloped from one reason or another. Pleopods with the setæ almost twice as long as the rami. — Uropods as in the majority of the preceding species, not fully as long as the two posterior segments combined; peduncle somewhat less than twice as long as deep; proximal joint of the endopod not quite as long as the peduncle and about as long as or a little longer than the distal joint (fig. 7 g); exopod scarcely half as long as first joint of the endopod.

Length of the females without marsupium 2.5—2.8 mm.

Remarks. The differences between *L. hastata* and the two following species are pointed out in the "Remarks" on these species.

Occurrence. *L. hastata* has been taken by the "Ingolf" at two deep-sea stations in the cold area.

East of Iceland: St. 102: Lat. 66° 23′ N., Long. 10° 26′ W., 750 fm., temp. ÷ 0.9°; 2 spec.

North of Iceland: St. 125: Lat. 68° 08′ N., Long. 16° 02′ W., 729 fm., temp. ÷ 0.8°; 1 spec.

50. **Leptognathia armata** n. sp.

(Pl. VIII, figs. 1 a—1 f.)

Female (without marsupium) and subadult Male. This species is so closely allied to *L. hastata* that it is nearly sufficient to point out the differences. — The antennulæ of the female almost as in *L. hastata*. The antennulæ of the subadult male (fig. 1 a) five-jointed, very thick; first joint a little shorter than the other joints combined, a little more than twice as long as deep, at the end somewhat less deep than somewhat beyond the base; second joint a little more than half as long as the first, somewhat more than half as long again as deep and considerably produced above; third joint short and thick; fourth and fifth joints combined somewhat shorter than the upper margin of the second, and fourth joint considerably deeper than long.

The chelipeds have the carpus two-thirds as long again as deep and its distal part is very moderately expanded downwards with the corresponding lower margin somewhat convex (fig. 1 b) — thus the carpus is conspicuously longer in proportion to depth and less expanded downwards than in *L. hastata*. The chela is slightly shorter than the carpus and a little more than twice as long as broad, otherwise as in *L. hastata*.

Second and third pairs of legs (figs. 1 c and 1 d) nearly as in *L. hastata*. but the denticles on the posterior margin of sixth joint are very distinct, in the female specimen (fig. 1 d) besides developed on fifth joint. Three posterior pairs (fig. 1 e) with the setiform denticles on seventh joint scarcely as long as in *L. hastata*.

Four anterior abdominal segments (fig. 1 f) with the ventral tubercles strongly chitinized, rather large and varying in shape, either subconical or a little obliquely and somewhat broadly truncate.

The process from fifth ventral tubercle is still broader at the base and longer than in *L. hastata* and besides not horizontal but directed backwards and somewhat downwards. Pleopods and uropods about as in *L. hastata*.

Length of the female without marsupium 3.8 mm, of the subadult male 3.3 mm.

Remarks. *L. armata* is so closely allied to *L. hastata* that I hesitated before establishing it as a separate species. But it seems to be a good deal larger than *L. hastata* and differs by having the carpus of the chelipeds less robust and conspicuously less expanded downwards, furthermore by the much more developed ventral abdominal tubercles and a different direction of the process from fifth segment. And judging from the species belonging to the subdivions α and β of the same group a the shape of the carpus and the development of abdominal tubercles afford valuable specific characters. Finally *L. armata* was taken in very deep water with the temperatures above zero, while *L. hastata* was captured in considerable depths in the cold area. — The differences between both species and the next form, *L. Amdrupii*, are pointed out below.

Occurrence. *L. hastata* has been taken by the "Ingolf" at two stations.

Davis Strait: St. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fm., temp. 1.5°; 1 spec.(♀).

South-West of Cape Farewell: St. 22: Lat. 58°10′ N., Long. 48°25′ W., 1845 fm., temp. 1.4°; 1 spec. (subad. male).

51. **Leptognathia Amdrupii** n. sp.

(Pl. VIII, figs. 2a—2c.)

Female. So closely allied to *L. hastata* and *L. armata* that it may be sufficient to mention some features. — The antennulæ (fig. 2a) are distinctly more slender than in those species, and the first joint is slightly more than two and a half times as long as deep, but the relative length of their joints shows no essential difference. — The chelipeds (fig. 2b) are a little less robust; the carpus is about twice as long as the depth of its distal half which, in strong contradistinction to the other species, is distinctly less deep than the proximal half and with the lower margin nearly straight; chela a little longer than the carpus and more slender than in the two species mentioned, being considerably more than twice as long as broad; the movable finger almost longer than the front margin of the hand and as broad as the fixed finger. — Second pair of legs (fig. 2c) without spinules on the posterior margin of sixth joint.

Four anterior abdominal segments with the ventral tubercles rather low; the process from fifth segment about as long as in *L. hastata* but less horizontal, though scarcely directed as much downwards as in *L. armata*. Pleopods and uropods in the main as in *L. hastata*; exopod of right uropod two-jointed and distinctly more than half as long as first joint of the endopod, while the exopod of left uropod is much shorter and one-jointed, as second joint has not been developed.

Length of the female with marsupium 2.7 mm.

Remarks. By the shape of the carpus of the chelipeds *L. Amdrupii* is easily distinguished from the two preceding species. It differs on the whole a little more from *L. hastata* than from *L. armata*, but while the last-named species is only known from stations with positive temperatures at

the bottom and depths exceeding 1400 fathoms, *L. Amdrupii* was found in comparatively low water at the cold East Greenland.

The name is given in honour of G. C. Amdrup, Captain in the Danish Navy and the able leader of two Danish exploring expeditions to East Greenland.

Occurrence. Taken by the II[d] Amdrup Expedition at a single locality.

East Greenland: Forsblad Fjord, Lat. 72° 27′ N., 90—40 fm., 1 spec. (female with marsupium).

Group b. *Uropods long, with both rami two-jointed and the exopod conspicuously shorter than the first joint of the endopod. Pleopods in the female somewhat small with the marginal setæ at most as long as the rami or almost rudimentary. Animals slender or very slender.*

Species 52—53.

The animals of this group are on the whole allied to those of group a, but they are more slender with the pleopods considerably or much reduced and the articulation between fourth and fifth joint of the antennæ feebly developed.

52. **Leptognathia tuberculata** n. sp.

(Pl. VIII, figs. 3a—3f.)

Female. Body much more slender than in any of the preceding species, but the animal in other respects rather similar in general aspect. — Antennulæ (fig. 3a) slightly more than two-thirds as long as the carapace. First joint a little shorter than the three other joints combined, somewhat more than twice as long as deep, considerably tapering; second joint considerably produced above, distinctly more than twice as long as deep and with the upper margin conspicuously more than half as long as first joint; third joint short, fourth joint much shorter than the upper margin of the second. — Antennæ with the articulation between fourth and fifth joint feebly developed, less or more indistinct, and fifth joint about twice as long as the fourth, which is a little shorter than the sixth.

Chelipeds somewhat robust (fig. 3a). Carpus only half as long again as deep, with the distal half strongly expanded downwards and the corresponding part of the lower margin much curved and even subangular. Chela somewhat longer than the carpus and twice as long as broad, with the anterior lower corner of the hand angular; movable finger a little shorter than the anterior margin of the hand and with the subbasal part slightly narrower than the fixed finger, which has four teeth on the incisive margin.

Thoracic legs somewhat short (fig. 3a) and moderately slender. Second (fig. 3b) and third pairs with the spines on fourth and fifth joint very long; sixth joint nearly half as long again as the fifth, which is a little shorter than seventh with claw. Three posterior pairs (fig. 3c) with sixth joint as long as seventh with claw; seventh joint without any distinct row of minute setæ.

Four anterior abdominal segments (fig. 3d) with the median row of ventral tubercles low, while the tubercle on the fifth segment is more than twice as high, broadly conical, acute and even a little acuminate. Pleopods almost rudimentary, biramous, but the rami are shorter and much narrower than the small peduncle (fig. 3e), with a small terminal seta and a few minute marginal setæ. — Uropods

as in the species of group a, scarcely as long as the two posterior segments combined; peduncle twice as long as deep, distinctly more than half as long as the first joint of the endopod; the joints of the endopod subequal in length and the first joint conspicuously less than twice as long as the two-jointed exopod.

Length of a female with marsupium 3.3 mm, of a female without marsupium 3.1 mm.

Subadult Male. — The antennulæ five-jointed and as usually much thicker than in the female. In my single specimen the ventral tubercles on the four anterior abdominal segments are somewhat higher than in the females, while the tubercle of the fifth segment is obtuse, but probably damaged or misshaped. The pleopods are well developed (fig. 3f); as fig. e, representing a pleopod of the female, and fig. 3f, representing that of the male, were drawn with the same degree of enlargement, the comparison between these two figures will convey an idea of the enormous difference in size and development, and it may be added that the female is considerably larger than the subadult male in question. The endopod is nearly twice as long as the peduncle and has its distal rounded margin furnished with setæ as long as the ramus; the exopod is somewhat longer than the endopod, but the setæ along the terminal margin are only as long as those of the endopod. — Length of the specimen 2.4 mm.

Remarks. *L. tuberculata* is more slender than any among the above-described species; the female is easily recognized by the nearly rudimentary pleopods and the development of the ventral abdominal tubercles. The shape of the chelipeds and the relative length of the joints of the antennulæ afford additional characters.

Occurrence. The species has been taken by the "Ingolf" at two deep-sea stations in the warm area.

Davis Strait: St. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fm., temp. 2.4°; 4 spec.
— — St. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fm., temp. 1.5°; 1 spec.

53. **Leptognathia uncinata** n. sp.

(Pl. VIII, figs. 4a—4i.)

Female (without marsupium). This species is closely allied to *L. dentifera* G. O. Sars, of which a co-type presented by Sars himself has been examined. The two species agree with one another in the following more important particulars. The antennulæ are characteristic (fig. 4a); first joint is considerably shorter than the three others combined, very thick, conspicuously less than twice as long as deep; second joint is uncommonly long and thick, about two-thirds as long as the first, somewhat produced above, and its upper margin a little longer than the two distal joints combined and a little more than twice as long as the depth of the joint. — Antennæ with fourth joint about half as long as the fifth, and the articulation between them feebly developed. Chela (fig. 4b) as long as the carpus, twice as long as broad, with the two setæ on the posterior margin extremely thick; the anterior distal angle above the insertion of the movable finger is protruding and even produced as a short, obtuse process. — Second pair of legs (fig. 4c) with fifth joint a little shorter than the fourth and only half as long as the sixth, which is considerably longer than seventh joint with claw

and furnished with minute denticles along the lower margin; seventh joint strongly marked off from the claw, with a distinct spinule at the end. — Ventral tubercles on the five abdominal segments very low (fig. 4d). — Uropods as long as in the *Sarsii*-group; the peduncle (fig. 4e), measured to the insertion of the rami, slightly longer than the first joint of the endopod. thick and distally above produced in a large, oblong, subacute or acute process directed somewhat backwards and gradually curved much upwards; endopod with its two joints subequal in length; the two-jointed exopod somewhat (in *L. dentifera*) or considerably (in *L. uncinata*) shorter than first joint of the endopod.

But the two species are separated by two features. In *L. dentifera* G. O. S. the carpus of the cheliped is a little less than twice as long as deep, while in *L. uncinata* it is conspicuously deeper, being only half as long again as deep (fig. 4b), the distal third being considerably expanded downwards. In *L. dentifera* the pleopods are very small, slightly longer than in *L. tuberculata* (comp. fig. 3d), in my specimen from Norway even less developed than according to Sars' fig. *2 plp*, and each ramus has a single seta less than half as long as the ramus and some tiny hairs; in *L. uncinata* the pleopods (fig. 4d), though reduced in size, are much larger than in *L. dentifera* with a number of very conspicuous setæ and some among them as long as the rami.

Length of the specimen 2.1 mm.

Adult Male. Antennulæ seven-jointed (fig. 4f); the two proximal joints robust, together considerably longer than the other joints combined, and second joint about two-thirds as long as the first; seventh joint half as long again as the sixth; fourth, fifth and sixth joints each with a bundle of sensory filaments from the lower end. — Antennæ with the articulation between fourth and fifth joint very distinct; fifth joint scarcely twice as long as the fourth, but only a little longer than the sixth.

Chelipeds somewhat robust (fig. 4f). Carpus about half as long again as deep, with the distal third distinctly expanded downwards. Chela considerably longer than the carpus, twice as long as broad, nearly triangular in aspect; distal anterior angle of the hand above the insertion of the finger protruding but a little rounded; movable finger a little shorter than the anterior margin of the hand. somewhat narrow, being scarcely half as broad as the fixed finger at the base, and its incisive margin without serration; fixed finger with half of its incisive margin finely serrate.

Second (fig. 4g) and third pairs of legs with the sixth joint only a little longer than the fifth and about as long as seventh joint with claw. Posterior pairs (fig. 4h) with seventh joint elongate, slightly longer than the sixth and about half as long again as the claw.

Sixth abdominal segment (fig. 4i) posteriorly rounded. — Uropods with the peduncle as long as second joint of the endopod, which is slightly shorter but much thinner than its first joint; the two-jointed endopod somewhat more than half as long as first joint of the endopod.

Length 1.5 mm.

Remarks. It was after considerable hesitation that I established *L. uncinata* as a new species, but the two differences pointed out between the females of *L. uncinata* and *L. dentifera* seem to be so important, that the deep-sea form ought to be established as a separate species.

I think that the reference of the adult male to this species is quite certain. This male is so small that it cannot belong to *L. armata* or *L. tuberculata* taken at the same station. Furthermore

the chelipeds of the male agree so well with those of the female in several particulars: length in proportion to depth or breadth of carpus and chela, protruding anterior angle of the hand, rather narrow movable finger and general shape of the fixed finger, and this agreement is larger than otherwise generally found in the chelipeds of the two sexes. The thickness and relative length of the two proximal joints of the antennulæ is also nearly the same in the two sexes, and perhaps the most important character is the long peduncle of the uropods in both sexes, as this joint in the male is nearly as long as, in the female slightly longer than, the first joint of the endopod, while in the females of all preceding species of the genus excepting the large *L. brachiata* the peduncle is much shorter than the first joint of the endopod.

Occurrence. Taken by the "Ingolf" at the following station.

Davis Strait: St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 2 spec. (♀ and ♂).

It may be mentioned that the "Ingolf" at Stat. 103: Lat. 66° 23′ N., Long. 8° 52′ W., 579 fm., temp. ÷ 0.6°, captured a considerably smaller, juvenile specimen, which is at least allied to *L. uncifera* and *L. dentata*, but the process from the peduncle of the uropods is very small and subhorizontal, probably not yet developed.

Group c. *Uropods with the endopod two-jointed, the exopod well marked off, one-jointed.*

These characters pointed out are very practical. But the group comprises in reality rather heterogenous elements, and its nine species mentioned on the following pages may be referred to three natural subdivions.

α. Pleopods wanting or extremely rudimentary in the females. The basal joint of the chelipeds normal, possessing a posterior process with the hind margin free and rounded. Slender species. Species 54—58.

β. Pleopods very distinct with well developed setæ in the females. The basal joint of the chelipeds normal, as in subdivision *α*. Very stout species. Species 59—60.

γ. Pleopods very distinct with well developed setæ in the females. The basal joint of the chelipeds aberrant, in a lateral view the long major part of its posterior margin is vertical and attached to the cephalothorax at or even before its middle, while the posterior process is short and situated more on the lower than on the lateral side of the cephalothorax. Species 61—62.

Group c, subdivision *α* (vid. above).

54. **Leptognathia manca** G. O. Sars.

(Pl. VIII, figs. 5a—5d.)

1881. *Leptognathia (?) manca* G. O. Sars, Arch. for Math. og Naturv., B. 7, p. 44.

1896. — — — Account Crust. Norway, Vol. II, p. 30, Pl. XIV, fig. 2.

Though Sars' description and figures are sufficient for the recognition of this species, I think it useful for comparison with the following forms of this subdivision to give a new description and a

couple of analytical figures of the female, together with corresponding figures of the hitherto unknown subadult male.

Female. The shape of the body from above is shown well by Sars' fig. 3; third to sixth thoracic segments have their lateral margins far from parallel, but conspicuously though not strongly angular, and the body tapers in breadth from the third segment.

Antennulæ (fig. 5a) considerably shorter than the carapace. First joint a good deal shorter than the other joints combined, about twice as long as deep, considerably tapering; second joint slightly more than half as long as the first and much produced above; upper margin of third joint distinctly less than half as long as that of the second; fourth joint about as long as the second and a little shorter than its terminal setæ. — Antennæ with fourth and fifth joint completely fused, without any vestige of an articulation between them.

Chelipeds (fig. 5a) somewhat slender. Basal joint not much longer than the distance between the rounded hind margin of its well developed posterior process and the front margin of second segment. Carpus almost twice as long as deep, with the lower margin feebly convex. Chela a little longer than the carpus, two and a half times, or even more, as long as broad; hand without any protruding anterior angle at the insertion of the finger, and this finger is about as long as the front margin of the hand; fixed finger slightly broader than the movable, with the teeth on the incisive margin distinct.

Second and third pairs of legs (fig. 5a) moderately strong or moderately slender; the spine on the posterior angle of fourth joint about as long as the fifth joint, which is somewhat shorter than the sixth joint, while the spines on its distal angles are long, though shorter than the joint; seventh joint with claw about as long as the sixth joint. — Three posterior pairs of legs essentially as in the *Sarsii*-group.

Abdomen (fig. 5b) with the lower margin of the five anterior segments conspicuously convex, but not shaped as tubercles. — Uropods moderately long, conspicuously longer than the sixth segment; peduncle a little longer than deep, conspicuously shorter than the first joint of the endopod, which is slightly shorter than second joint; the one-jointed exopod nearly as long as, or slightly longer than, the first joint of the endopod.

Length of a female with marsupium 2 mm, of a female without marsupium 2.2 mm.

Subadult Male. In the main as the female, but it differs by much thicker antennulæ and in the abdomen. The antennulæ (fig. 5c) are conspicuously longer as compared with the carapace than in the female, only four-jointed, and their three proximal joints together with the proximal part of fourth joint are much thicker than in the other sex. — The five anterior abdominal segments (fig. 5d) are longer than in the female, and the median ventral margin of each segment is shaped as a moderately high, subtriangular tubercle with the end rounded. The pleopods are somewhat long with the outer ramus much longer than the peduncle and longer than the inner ramus; the terminal setæ about as long as the rami. — Length 1.8 mm.

Remarks. *L. manca* differs from *L. ventralis* n. sp. by a different shape of second and third antennular joints, by having no ventral process on the second thoracic segments and by the posterior margin of the basal joint of the chelipeds being rather remote from the front end of the second

thoracic segment. From *L. subæqualis* it differs in the shape of the body, which in the latter species is extremely slender with the lateral margins nearly parallel; furthermore the exopod of the uropods is proportionately conspicuously longer in *L. subæqualis* than in *L. manca*. *L. manca* is rather remote from the other forms of group c.

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

Davis Strait: St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; 23 spec.

South of East-Iceland: St. 90: Lat. 63° 43′ N., Long. 14° 34′ W., 90 fm., temp. 7.0°; 1 spec.

Distribution. Sars had this species from two widely separated places on the Norwegian coast, at depths of 100—150 fathoms. It has scarcely been mentioned by any other author.

55. **Leptognathia subæqualis** n. sp.

(Pl. VIII, figs. 6a—6f.)

Female. Body extremely slender (fig. 6a), nine or ten times as long as broad, seen from above nearly cylindrical, with fourth and fifth thoracic segments slightly broader than the carapace or the abdomen; the lateral margins of each thoracic segment nearly parallel, not angular but a little or conspicuously rounded at both ends of each segment. — Carapace, seen from above, about half as long again as broad, twice or more than twice as long as second thoracic segment but somewhat shorter than the two anterior segments combined; the front end of the carapace conspicuously more than half as broad as the carapace somewhat behind the middle; rostral process somewhat narrow.

Antennulæ almost as long as the carapace (fig. 6b), somewhat robust. First joint nearly as long as the three other joints combined, a little or somewhat more than twice as long as deep and with the proximal third considerably thickened downwards; second joint much produced above, with the upper margin distinctly more than half as long as first joint and twice as long as the depth of the joint itself; third joint with the upper margin very short; fourth joint conspicuously shorter than the second, much shorter than some of the terminal setæ. — Antennæ with fourth and fifth joints completely fused, without any vestige of an articulation.

Chelipeds (fig. 6b and 6c) moderately strong. Basal joint long, nearly as long as the carpus, with the rounded posterior process reaching near to the front lower angle of second thoracic segment. Carpus distinctly less than twice as long as deep, with its lower margin moderately arcuate. Chela slightly or a little longer than the carpus, somewhat more than twice as long as broad; anterior distal corner of the hand not protruding, obtuse; movable finger considerably shorter than the anterior margin of the hand and much narrower than the fixed finger, which has distinct, sharp teeth on the distal half of the inner margin.

Second (fig. 6b) and third pairs of thoracic legs moderately strong; posterior spine on fourth joint and both distal spines on fifth joint long; fifth joint only as long as the fourth; sixth joint more than half as long again as fifth joint, but a little shorter than seventh joint with claw. — Three posterior pairs of legs somewhat slender; sixth joint at least somewhat shorter than seventh joint with claw, and the claw as long as or shorter than seventh joint.

Abdomen cylindrical, as long as the sum of the two posterior thoracic segments. The lower

margin of the five anterior segments (figs. 6d and 6e) a little convex. The pleopods generally wanting; in a single specimen (from Stat. 4) which seems to be a female without marsupium, I found rudimentary pleopods (fig. 6e), each pleopod being a minute, a little oval plate. — The uropods moderately long, distinctly shorter than the two posterior segments combined; the peduncle a little longer than deep, considerably or much shorter than the first joint of the endopod; the two joints of the endopod equal in length or the first a little longer than the second; the one-jointed exopod reaches considerably beyond the end of the proximal joint of the endopod, but not fully to the middle of the distal joint.

Length of specimens with or without marsupium 1.7—1.9 mm.

Subadult Male. The four-jointed antennulæ (fig. 6f) considerably thicker than in the female, with first joint scarcely or distinctly less than twice as long as deep. Pleopods nearly as in *L. manca*; the outer remus is considerably or much longer than the oblong peduncle; the terminal setæ as long as or a little longer than the rami. — Length 1.4 mm.

Remarks. This small and extremely slender species is easily distinguished from allied forms of this group by the shape of the body and the length of the exopod of the uropods.

As in the Norwegian species of *Leptognathia* the mandibles of *L. subæqualis* have the molar process tapering to the acute end and besides distally curved.

Occurrence. This species has been taken by the "Ingolf" at six localities.

Davis Strait:	St. 32:	Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 6 spec.
West Greenland:	Mouth of Ameralik Fjord, near Godthaab, at	Lat. 64° 11′ N., 5—70 fm., shells; 16 spec.
East of Iceland:	St. 4:	Lat. 64° 07′ N., Long. 11° 12′ W., 237 fm., temp. 2.5°; 7 spec.
— - —	St. 58:	Lat. 64° 25′ N., Long. 12° 09′ W., 211 fm., temp. 0.8°; 2 spec.
North of the Færoes:	St. 139:	Lat. 63° 36′ N., Long. 7° 30′ W., 702 fm., temp. ÷ 0.6°; 35 spec.
— - - —	St. 141:	Lat. 63° 22′ N., Long. 6° 58′ W., 679 fm., temp. ÷ 0.6°; 11 spec.

This distribution is interesting, as the species has been taken both in the cold area with a temperature of ÷ 0.6° and in temperatures above zero, even + 3.9°; furthermore it occurred near land at a locality where the greatest depth was only 70 fathoms and at another station it was hauled up from 702 fathoms.

56. **Leptognathia tenella** n. sp.

(Pl. IX, figs. 1a—1e.)

Female (without marsupium). Body slender, the largest specimen about eight times as long as broad (fig. 1a), seen from above nearly cylindrical, with the lateral margins of the thoracic segments slightly convex and the abdomen tapering a little from the base to the end. — Carapace much shorter than the two anterior segments combined, seen from above slightly more than half as broad at the front end as behind the middle, not much longer than broad, with the lateral margins somewhat convex and the frontal process somewhat feebly developed.

Antennulæ (fig. 1b) only a little shorter than the carapace, very characteristic. First joint as long as the three other joints combined, about two and a half times as long as deep, with the

proximal third considerably thickened downwards. Second joint much produced above, very long, having the upper margin distinctly more than half as long as that of the first joint, somewhat longer than the two distal joints combined and more than twice as long as the depth of the joint; third joint extremely short; fourth joint considerably shorter than the second which is about as long as the terminal setæ. Antennæ somewhat short; fourth and fifth joints completely fused, together conspicuously less than twice as long as sixth joint.

Chelipeds (fig. 1 b) moderately robust. The basal joint is a little shorter than the carpus, its posterior process long, almost twice as long as deep with the end somewhat distant from the front lower end of second thoracic segment. Carpus a little less than twice as long as deep, with each of the two halves of the lower margin somewhat feebly convex. Chela a little longer than the carpus, a little more than twice as long as broad, presenting a somewhat peculiar aspect, because the posterior margin is conspicuously convex; no protruding angle above the insertion of the movable finger, and this finger is considerably shorter than the anterior margin of the hand and rather broad towards the base; the fixed finger has an acute tooth near the end of the incisive margin.

Second and third pairs of thoracic legs (fig. 1 b) somewhat robust; fourth joint with the posterior spine rather long; fifth joint a little shorter than the fourth, with the distal anterior spine long and much longer than the posterior; sixth joint not fully twice as long as the fifth and distinctly longer than seventh joint with its claw. — Three posterior pairs of legs moderately robust (fig. 1 c); the spines on fifth and sixth joints long; sixth joint somewhat shorter than seventh with its straight claw.

Abdomen as long as the two preceding segments combined; the sixth segment (figs. 1 d and 1 e) a little longer than the sum of the three preceding segments, thus a little longer than in the other species of this genus; this segment is somewhat produced behind, so that the uropods are inserted at, or even slightly before, the middle of its lateral margins, an arrangement producing a peculiar aspect. The lower margin of each of the five anterior segments either somewhat convex or even showing a somewhat low protuberance. — Uropods strong and considerably shorter than the sixth segment, reaching somewhat beyond the end of abdomen; peduncle much deeper than long; first joint of the endopod only half as long as the second, but yet a good deal longer than the small, one-jointed exopod.

Length of the largest specimen 1.7 mm.

Remarks. This species is easily recognized by the terminal part of the abdomen with its last segment produced posteriorly and the characteristic uropods originating at the middle of the lateral margins of the segments; the shape of the body, the antennulæ, the chelipeds afford further characters. — Mouth-parts unknown.

Occurrence. It has been taken by the "Ingolf" at a single station.

Davis Strait: St. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fm., temp. 2.4°; 3 spec.

57. **Leptognathia ventralis** n. sp.

(Pl. VIII, figs. 7 a—7 k.)

Female. Body slender (fig. 7 a), about seven times as long as broad, decreasing somewhat in breadth from the carapace to the end of abdomen. — Carapace as long as, or even slightly longer

than, the two following segments combined, considerably longer than broad, anteriorly a little more than half as broad as behind the middle, with the frontal process small and the posterior two-thirds of the lateral margins rather convex.

Antennulæ (fig. 7 b) considerably shorter than the carapace, moderately slender; first joint somewhat shorter than the three other joints combined, a little more than twice as long as deep, with the proximal third somewhat thickened downwards; second joint distinctly more than half as long as the first, not much produced above and about twice as long as deep; third joint as long above as below and slightly more than half as long as the second; fourth joint a little shorter than second, somewhat shorter than a couple of the terminal setæ. — Antennæ with fourth and fifth joints completely fused, together about three times as long as sixth joint.

Chelipeds (fig. 7 b) moderately strong. The basal joint considerably shorter than the carpus; its posterior process deeper than long, and its free hind margin reaches almost or fully to the anterior lower end of the second segment. Carpus somewhat long, about twice as long as deep, with the lower margin somewhat convex. Chela slightly or somewhat longer than the carpus, somewhat more than two and a half times as long as broad; no protruding angle above the movable finger, which is slightly shorter than the anterior margin of the hand and moderately broad; fixed finger with a tooth near the end.

Thoracic segments, seen from above (fig. 7 a) somewhat peculiar. Second segment short, very much shorter than the third and decreasing much in breadth backwards. Third to sixth segments each with the antero-lateral angles somewhat protruding and rounded, the lateral margins with the anterior half distinctly concave, at or behind the middle a little protruding and then converging much to the front margin of the next segment; seventh segment in the main of the same shape, but the convex part of the lateral margin is situated more backwards and is more protruding. Anterior ventral part of second segment produced in a conical, oblique process directed forwards and downwards, generally large and acute (as in the subadult male, fig. 7 i), but in a couple of females (one of which with marsupium) the process is smaller with the end obtuse (fig. 7 b). — Thoracic legs somewhat slender and long. Second and third pairs with rather long or long distal spines on fourth and fifth joint (figs. 7 b, 7 e and 7 h); sixth joint varies in length, being from a little shorter (fig. 7 h) to somewhat or considerably longer than fifth joint (figs. 7 b and 7 e), but it is always somewhat shorter than seventh joint with claw. Three posterior pairs (fig. 7 f) with the spines on fifth and sixth joint long and sixth joint shorter than seventh with claw.

Abdomen as long as the two preceding segments combined. Five anterior segments with their lower margin rather convex (fig. 7 g); pleopods entirely wanting. Sixth segment not quite as long as the three preceding segments combined, seen from above (fig. 7 a) with the portion between the uropods broadly triangular, acute. — Uropods slender and somewhat long, longer than the two posterior segments combined (fig. 7 g); peduncle much longer than deep, but considerably shorter than the proximal joint of the endopod; endopod with second joint distinctly longer than the first; the exopod thin and more than half as long as the first joint of the endopod but always somewhat shorter than that joint.

Lengt of females with or without marsupium 2—2.1 mm.

Subadult Male. The antennulæ (fig. 7 i) much thicker than in the female, nearly as long as the carapace; first joint twice as long as deep; fourth joint conspicuously longer than in the female and distinctly longer than second. Pleopods long, about as long as the last segment (fig. 7 k) and especially the exopod is long in proportion to the peduncle, but the terminal setæ are only about half as long as the exopod. — Length 1.5—1.7 mm.

Remarks. *L. ventralis* is somewhat allied to *L. manca* and *L. subæqualis* but easily separated by the shape of the thoracic segments, by the uropods and by the ventral process on second thoracic segment.

The mandibles of *L. ventralis* (fig. 7 c) differ materially in the shape of the molar processes from those in the species figured by Sars. The molar process of left mandible *(l)* is subcylindrical, its end cut off obliquely and furnished with about six triangular, obtuse teeth along the major part of the terminal margin and some four slender teeth at the posterior part of that margin; the molar process of the right mandible has in the main the same shape, but its oblique end has few and feeble teeth and besides a single spine.

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

South of the Davis Strait: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 1 spec.
South of Iceland: St. 64: Lat. 62° 06′ N., Long. 19° 00′ W., 1041 fm., temp. 3.1°; 1 spec.
East of Iceland: St. 101: Lat. 66° 23′ N., Long. 12° 05′ W., 537 fm., temp. ÷ 0.7°; 1 spec.
Jan Mayen: St. 115: Lat. 70° 50′ N., Long. 8° 29′ W., 86 fm., temp. 0.1°; 22 spec.

This occurrence is somewhat astonishing. It is seen that the depths of the four stations vary from 86 to 1870 fathoms, the temperatures of the bottom from 3.1° to ÷ 0.7°. In vain I have attempted to find any valuable difference between the specimens from these stations. In the specimen from Stat. 38 (1870 fm.) the sixth joint of second and third pairs of legs is a little shorter as compared with fifth joint, the spines on fourth to sixth joint are longer and the uropods slightly longer than in the specimens from Stat. 115, but these differences seem to me to be insufficient as specific characters.

58. **Leptognathia acanthifera** n. sp.

(Pl. IX, figs. 2 a—d).

Female (without marsupium). Somewhat slender (fig. 2 a) a little less than seven times as long as broad, but decreasing considerably in breadth from second thoracic segment to the end of abdomen. — Carapace almost as long as the two following segments combined, anteriorly a little more than half as broad as behind the middle and with the posterior two-thirds of the lateral margins rather convex.

Antennulæ (fig. 2 b) somewhat short, considerably or much shorter than the carapace, somewhat robust. First joint almost as long as the three other joints combined, nearly half as deep as long; second joint scarcely half as long as the first, not much produced above; third joint distinctly longer than deep, with the upper margin a little more than half as long as that of second joint; fourth joint somewhat shorter than the second and somewhat shorter than its terminal setæ. — Antennæ without any vestige of an articulation between fourth and fifth joint.

Chelipeds (fig. 2 b) moderately strong. The basal joint somewhat large, a little shorter than the carpus, with the posterior protuberance well developed and the free rounded hind margin a little in advance of the front lower end of second thoracic segment. Carpus a little more than twice as long as deep, with its lower margin rather feebly curved. Chela somewhat longer than the carpus, almost two and a half times as long as broad; movable finger somewhat robust, as long as the anterior margin of the hand.

Thoracic segments, seen from above (fig. 2 a), with the lateral margins somewhat angular; on second to fourth segment the angles are situated before the middle and more or less rounded, on fifth and sixth segment the angles are respectively a little and somewhat behind the middle and moderately sharp, while on seventh segment no angle but a rounded protuberance is seen on each side near the posterior margin. Second segment somewhat or considerably shorter than the third, without any ventral process, but second, third and fourth segments have their lateral margins behind the insertion of each leg produced in a somewhat broad, oblong, acute process (fig. 2 b) directed downwards and distally curved forwards; the processes on second segment are somewhat large and larger than those on the two other segments; the processes are not visible when the animal is seen from above. — Thoracic legs (figs. 2 b and 2 c) somewhat long and slender, with sixth joint distinctly shorter than seventh with claw. Second and third pairs (fig. 2 b) subequal; posterior spine of fourth joint rather long; fifth joint about as long as the fourth, with its two distal spines of very moderate length.

Abdomen as long as seventh, sixth and half of fifth segment combined, decreasing distinctly in breadth backwards; sixth segment shorter than the three preceding segments combined but only a little shorter than broad, broadest at the middle, and with the proximal part of the lateral margins somewhat concave. Ventral margin of the five anterior segments somewhat convex (fig. 2 d); no pleopods. — Uropods (fig. 2 d) slender, about as long as the sum of the two posterior segments; peduncle a little longer than deep; endopod with second joint distinctly longer than the first; exopod slightly more than half as long as first joint of the endopod.

Length of the largest specimen 1.7 mm.

Remarks. *L. acanthifera* is easily separated from all other species by the lateral processes of second to fourth segment; furthermore the antennulæ are somewhat short and the uropods characteristic.

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

Davis Strait: St. 36: Lat. 61° 59′ N., Long. 50° 21′ W., 1435 fm., temp. 1.5°; 3 spec.

Group c, subdivision β (vid. p. 85).

59. **Leptognathia breviremis** Lilljeborg.

Pl. IX, figs. 3 a—3 g).

1864. *Tanais breviremis* Lilljeborg, Bidrag til kännedomen om de inom Sverige och Norrige förek. Crust. of .... Tanaidernas familj, p. 21 (Female).

! 1896. *Leptognathia breviremis* G. O. Sars, Account Crust. Norway, Vol. II, p. 28, Pl. XIII, fig. 1.

Female. Though Sars has published a good description with figures of this form, it may be useful to point out a number of features.

The antennulæ (fig. 3 a) are moderately stout and considerably shorter than the carapace. First joint nearly as long as the other joints combined, scarcely or distinctly more than twice as long as deep; second joint nearly half as long as the first and considerably produced above; third joint with its upper margin very short; fourth joint a little shorter than second, with its terminal setæ somewhat long. — Antennulæ with the articulation between fourth and fifth joint indistinct or moderately distinct.

Chelipeds somewhat long and moderately slender (fig. 3 a). Basal joint normal, somewhat long but yet somewhat shorter than the carpus, and the posterior margin of the protuberance reaches about the front angle of second thoracic segment. Carpus slightly or scarcely more than twice as long as deep, with its lower margin almost straight. Chela scarcely as long as the carpus, somewhat more than twice as long as broad; hand uncommonly long, with the anterior margin almost half as long again as the movable finger and with only a single seta at the hind margin at the base of the fixed finger, which has at least the distal tooth of the incisive margin triangular and well developed.

Thoracic legs moderately slender; sixth joint about as long as or, especially in the posterior pairs, a little longer than seventh with claw. Second (fig. 3 a) and third pairs have the fifth joint at least not longer than the fourth but much shorter than the sixth, and the setæ of moderate length.

Abdomen (figs. 3 b and 3 c) has the ventral margin serrate, as each of the five anterior segments has a well developed, oblique, triangular or distally obliquely cut, conspicuous process. Sixth segment not fully as long as the sum of the three preceding segments. Pleopods somewhat short and broad, with the setæ well developed and some of these longer than the rami. — Uropods short, in smaller specimens somewhat, in large specimens considerably or much, shorter than the last segment; endopod with first joint conspicuously shorter than, or about as long as, the second; exopod a little or somewhat shorter than the endopod.

Length of one of the largest specimens without marsupium (from the "Ingolf" Stat. 38) 1.8 mm, of an ovigerous female (from Stat. 117) 1.4 mm, of an ovigerous female from Norway 1.3 mm.

Subadult Male. Antennulæ as usually considerably thicker and the pleopods somewhat longer than in the female.

Adult Male (figs. 3 d—3 g). Antennulæ 7-jointed; the two proximal joints very thick and the upper margin of first joint about half as long again as that of the second; third and fifth joints quite short, fourth joint extremely short, these three joints taken together not quite as long as the second; fourth and fifth joints each adorned with very long sensory filaments; sixth joint either conspicuously longer than, or only as long as, the three preceding joints combined, at the lower distal angle with a bundle of shorter sensory setæ, and either a little longer or even a little shorter than seventh joint, which terminates in two strong setæ and a sensory hair. — Antennæ only as long as the upper margin of the two proximal antennular joints, terminating in an extremely long seta.

Chelipeds (fig. 3) long and moderately slender; carpus twice as long as deep. Chela considerably longer than the carpus, somewhat less than three times as long as broad; hand elongate, with the anterior margin half as long again as the movable finger, which is slender, while the fixed finger is broad at the base and its incisive margin extremely finely serrate, a feature visible only under high magnifying power.

Thoracic segments as usually short, together even less than twice as long as the carapace. Seventh segment with a large, obliquely triangular ventral process. — Thoracic legs long and slender; second (fig. 3d) and third pairs with the sixth joint almost half as long again as the fifth and scarcely longer than seventh with claw. Fifth pair with seventh joint plus claw considerably longer than sixth joint, while in the two posterior pairs (fig. 3e) the difference in length between the same parts is somewhat small.

Abdomen (fig. 3f) extremely long, about twice as long as the six thoracic segments combined; the five anterior segments each with an obliquely triangular ventral process, which is large on first segment, and the processes decrease gradually in size from first to fifth segment, so that that of the last-named segment is quite low. Pleopods long with extremely long setæ. Sixth segment about as long as the two preceding segments combined, posteriorly produced in a triangular, acute process. — Uropods inserted before the middle of their segment and reaching somewhat beyond its end; endopod three-jointed and last joint a little (fig. 3g) or somewhat (fig. 3f) shorter than the two others combined; exopod one-jointed, very slender, slightly longer than the first joint of the endopod.

Length 1—1.1 mm.

Remarks. The female and subadult male of *L. breviremis* are easily distinguished from all other species of the genus excepting *L. crassa* n. sp. by the thick body, the short uropods, etc. By the rather slender carpus and the slender chela with its proportionately long hand it can be separated from *L. crassa*. The adult male was hitherto unknown.

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

Davis Strait:	St. 24:	Lat. 63°06′ N.,	Long. 56°00′ W.,	1199 fm., temp. 2.4°;	2 spec.
— —	St. 36:	Lat. 61°50′ N.,	Long. 56°21′ W.,	1435 fm., temp. 1.5°;	20 spec., 2 of which are adult males.
South of Davis Strait:	St. 38:	Lat. 59°12′ N.,	Long. 51°05′ W.,	1870 fm., temp. 1.3°;	6 spec.
South of Iceland:	St. 64:	Lat. 62°06′ N.,	Long. 19°00′ W.,	1041 fm., temp. 3.1°;	1 spec.
North of the Færoes:	St. 141:	Lat. 63°22′ N.,	Long. 6°58′ W.,	679 fm., temp. ÷ 0.6°;	large number of specimens.
— - - —	St. 139:	Lat. 63°36′ N.,	Long. 7°30′ W.,	702 fm., temp. ÷ 0.6°;	large number of specimens.
East of Iceland:	St. 105:	Lat. 65°34′ N.,	Long. 7°31′ W.,	762 fm., temp. ÷ 0.8°;	4 spec.
— - —	St. 103:	Lat. 66°23′ N.,	Long. 8°52′ W.,	579 fm., temp. ÷ 0.6°;	1 spec.
— - —	St. 102:	Lat. 66°23′ N.,	Long. 10°26′ W.,	750 fm., temp. ÷ 0.9°;	ab. 30 spec.
— - —	St. 101:	Lat. 66°23′ N.,	Long. 12°05′ W.,	537 fm., temp. ÷ 0.7°;	8 spec., one of which is an adult male.
North of Iceland:	St. 125:	Lat. 68°08′ N.,	Long. 16°02′ W.,	729 fm., temp. ÷ 0.8°;	8 spec.
North-East of Iceland:	St. 120:	Lat. 67°29′ N.,	Long. 11°32′ W.,	885 fm., temp. ÷ 1.0°;	6 spec.
— - —	St. 119:	Lat. 67°53′ N.,	Long. 10°19′ W.,	1010 fm., temp. ÷ 1.0°;	33 spec.
South of Jan Mayen:	St. 118:	Lat. 68°27′ N.,	Long. 8°20′ W.,	1060 fm., temp. ÷ 1.0°;	1 spec.
— - - —	St. 117:	Lat. 69°13′ N.,	Long. 8°23′ W.,	1003 fm., temp. ÷ 1.0°;	large number of specimens.

Distribution. Lilljeborg established *L. brevirostris* on specimens taken at Bohuslän, 50—60 fathoms, and at Molde (the western coast of Norway, at Lat. 62° 45′ N.), 40—50 fathoms. Sars possessed it from Christiania Fjord, 20—60 fathoms, and from several places on the South and West coasts of Norway, northwards to Kvalo, at Lat. 70° 40′ N. In 1910 I mentioned it from two places in the Kattegat, 15 and 17 fathoms and from a place in Skager Rak, 125 fathoms. Besides the species has been taken between Norway and the Orkneys, 150 fathoms (Internat. Investig.), at some places on both sides of Scotland, f. inst. near Aberdeen, 45 fathoms, and in Loch Fyne pelagically in a vertical haul (T. Scott), furthermore off Northumberland (G. S. Brady), at Plymouth (A. M. Norman) and off West Ireland, 320 fathoms (Tattersall).

The perusal of the preceding lines and of the "Ingolf" stations shows the bathymetrical occurrence to be extremely remarkable. In vain I have attempted to find any difference worth mentioning between females from 1870 fathoms in the warm area, from 1003 fathoms in the cold area and Norwegian specimens from 20—60 fathoms presented by Sars. To begin with I had believed that the specimens from the "Ingolf" belonged to a species different from the *L. brevirostris* occurring at Denmark and Norway, but after a detailed examination I was forced to abandon that opinion, as I could not find any other difference than that the uropods seem to be a little longer and sixth abdominal segment a little less highly vaulted in the Norwegian specimens (fig. 3c) than in specimens from the deepest "Ingolf" stations.

60. **Leptognathia crassa** n. sp.

(Pl. IX, figs. 4a—4e.)

Female (without marsupium). Body uncommonly robust (fig. 4a), from four and a half to slightly more than five times as long as broad, seen from above subcylindrical, with the abdomen slightly narrower than the thorax and the lateral margins of the thoracic segments slightly convex. — Carapace a little shorter than the two following segments combined (fig. 4a), slightly broader than long and at the anterior end about half as broad as a little from the base; frontal process feebly developed, short, broad, acute.

Antennulæ (fig. 4b) only a little shorter than the carapace. First joint a little shorter than the other joints combined, robust, not fully twice as long as deep and somewhat produced above; second joint thick, distally much produced above, with the upper margin as long as the depth of the first joint; third joint with the upper margin very short; fourth joint slightly shorter than the upper margin of the second, slender and subcylindrical, with the terminal setæ somewhat long. — Antennæ with fourth and fifth joints completely fused, and this fourth joint only half as long again as the penultimate joint.

Chelipeds robust (fig. 4b). Basal joint thick, with the free hind margin of the posterior protuberance reaching to second thoracic segment. Carpus somewhat longer than the basal joint, ovate, somewhat or considerably less than twice as long as deep, with the free lower margin distinctly, the upper margin strongly convex. Chela slightly longer than the carpus, somewhat more than twice as long as broad; the hand with two strong setæ on the posterior margin at the base of the movable finger and its anterior margin only a little longer than the movable finger.

Thoracic segments subrectangular (fig. 4a) with their lateral margins slightly convex; third segment conspicuously less than half as long again as the second. — Legs of middle length (figs. 4b and 4c), and seventh joint with claw a little longer than sixth joint. Second and third pairs with sixth joint about as long as fifth plus half of the fourth and the setæ somewhat short; three posterior pairs (fig. 4c) with some of the setæ rather long.

Abdomen deep (fig. 4d) and as long as the sum of the three posterior thoracic segments; the ventral serration is low and feebly developed, but the margin of each segment shows a sharp angle. Pleopods small, but both rami with some well developed setæ about as long as the rami (fig. 4e). Sixth segment, seen from above (fig. 4a), as long as the sum of the three preceding segments and posteriorly broadly rounded. — Uropods (figs. 4d and 4e) only about half as long as their segment; peduncle deep; endopod with first joint almost as deep as long, thicker and much shorter than second joint and as long as, or slightly shorter than, the thin exopod.

Length of the largest specimen, a female without marsupium, 1.9 mm.

Remarks. *L. crassa* is similar to *L. breviremis*, but differs in several particulars. The antennulæ have the two proximal joints conspicuously thicker, but the fourth joint slender and cylindrical instead of conical. The chelipeds are much more robust with the carpus considerably deeper, the hand shorter in proportion to the movable finger than in *L. breviremis* and two strong setæ instead of one at the posterior base of the fixed finger. The abdomen has the ventral serration much less developed and the pleopods and uropods are distinctly smaller than in the other species.

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

South of Davis Strait: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 6 spec.

It may be added that after I had discovered the six specimens of this species between the specimens of *L. breviremis* from the same station, I looked in vain for more specimens among the numerous specimens of the last-named species from the other fourteen "Ingolf" stations.

Group c, subdivision γ (Vid. p. 85).

61. **Leptognathia polita** n. sp.

(Pl. IX, figs. 5a—5f.)

Female (without marsupium). Moderately robust (fig. 5a), about six and a half times as long as broad and seen from above subcylindrical, yet with the carapace and the middle of abdomen slightly broader than the thoracic segments, which have their lateral margins almost straight, being curved only at both ends of each segment. — Carapace slightly longer than the sum of the two next segments, seen from above (fig. 5a) nearly hexagonal and broadest considerably before the middle, where each lateral margin has a pronounced angle, and from these angles the margins converge slightly to the base and strongly to the front end, which is conspicuously less than half as broad as the carapace between the angles mentioned; frontal process low, rounded.

Antennulæ (fig. 5b) much shorter than the carapace and rather slender. First joint almost as long as the other joints combined, two and a half times as long as deep; second joint considerably produced above, half as long as the first and above a little more than twice as long as deep; third

joint with the upper margin half as long as that of second joint and conspicuously longer than the depth of the joint; fourth joint considerably shorter than the second and its longest terminal seta longer than the two distal joints combined. — Antennæ only a little shorter than the antennulæ, with fourth and fifth joints well separated.

Chelipeds (figs. 5b and 5c) strong and very curious. Basal joint nearly deeper than long; the posterior protuberance is, seen from the side, small, about as long as deep and with only the lower margin free, while even the posterior end is situated somewhat before the middle of the cephalothorax; the area between the hind margin of the basal joint and the thinner integument behind the cephalothorax is large, oblong, more than twice as long as deep and well separated by a thin-skinned, horizontal ridge from the carapace. The carpus, though a good deal longer than the basal joint with posterior protuberance, is short and deep, being less than half as long again as deep, with the upper margin very convex and the lower peculiarly hollowed. Chela somewhat longer than carpus and twice as long as broad; anterior margin of the hand distinctly shorter than the movable finger, which is very thick towards the base (fig. 5c) with its incisive margin very sinuate, having a broad, oblong-triangular protuberance before the middle; fixed finger with two tubercles on the incisive margin, the proximal being somewhat small though very distinct, the distal large, much broader than high, rounded; two setæ on the posterior margin of the hand, and the end of both fingers obtuse.

Second thoracic segment somewhat shorter than the third (fig. 5a); all segments transverse and all, excepting the seventh, subquadrangular with the angles rounded. — Thoracic legs uncommonly short. Second (fig. 5d) and third pairs moderately slender; distal spines on fourth and fifth joints moderately long; sixth joint somewhat longer than the fifth and a little longer than seventh with claw; the claw a little more than half as long as seventh joint.

Abdomen somewhat shorter than the three preceding segments combined (fig. 5a). Five anterior segments each with a rounded, moderately large ventral protuberance; pleopods moderately small and their rami with somewhat long setæ (fig. 5f). Sixth segment about as long as the three preceding segments combined. — Uropods a little shorter than their segment, somewhat robust; peduncle longer than deep; first joint of the endopod a little longer than the second and somewhat longer than the one-jointed exopod.

The body of the animal is polished, shining, yellowish, and the fingers of the chelæ are deep reddish yellow.

Length of the single probably full-grown specimen 3.2 mm.

Remarks. This species is moderately large and easily distinguished from all other forms of the genus excepting *L. vicina* n. sp. by its shape, colour, uropods, etc., but especially by the peculiar development of the chelipeds, which originate before the middle of the cephalothorax. The differences between *L. polita* and *L. vicina* are pointed out in the "Remarks" on the latter species.

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

North of the Færoes: St. 141: Lat. 63° 22′ N., Long. 6° 58′ W., 679 fm., temp. ÷ 0.6°; 1 probably full-grown specimen and 1 juvenile specimen without seventh pair of legs.

62. **Leptognathia vicina** n. sp.

(Pl. IX, figs. 6a—6i.)

Female. Moderately robust (fig. 6a), from six to seven times as long as broad and seen from above subcylindrical, yet with the carapace and the middle of abdomen from slightly to distinctly broader than the thoracic segments. — Carapace nearly as long as, or slightly longer than, the two following segments combined (fig. 6a), seen from above less or more distinctly hexagonal and subsimilar to that of *L. polita*, but the broadest place is only a little before the middle; frontal process small, acute.

Antennulæ (fig. 6b) much shorter than the carapace and moderately slender. First joint somewhat shorter than the three other joints combined, a little more than twice as long as deep; second joint distally moderately produced above, with its upper margin half as long as the first joint but not quite twice as long as the depth; third joint above slightly more than half as long as the second; fourth joint a little shorter than the second and not much shorter than its terminal setæ. — Antennæ as long as the three proximal antennular joints combined, with fourth and fifth joints well separated and fifth joint half as long again as the fourth, which is slightly longer than the sixth.

Chelipeds (figs. 6b and 6f) somewhat similar to those in *L. polita*, but yet showing some differences. Basal joint about as long as deep, with the posterior protuberance, seen attached to the animal and from the side, not only somewhat short but low — when the cheliped has been removed and pressed a little under a glass-cover that protuberance shows itself to be a good deal broader (fig. 6f) because its lower part, which on the animal turns downward, then becomes visible. The area between the basal joint and the thin integument behind the cephalothorax is large, a little more than twice as long as deep, but the hind margin of the posterior protuberance is yet situated a little behind the middle of the cephalothorax. Carpus much longer than the basal joint, conspicuously less than half as long again as deep, and its lower margin has a conspicuous protuberance bearing two setæ. Chela as long as the upper margin of carpus plus the basal joint and a little more than twice as long as broad; anterior margin of the hand a little longer than the movable finger, which is very thick towards the base, but its incisive margin has its proximal half a little concave and without any protuberance before the middle; the fixed finger has on the incisive margin a feeble proximal and a more oblong and conspicuous though rather low distal protuberance.

Thoracic segments (fig. 6a) transverse with their lateral margins a little convex or rather subangular and as usually in such cases second to fourth segments are broadest before the middle, the other segments broadest gradually more and more behind the middle. Second thoracic segment somewhat or considerably shorter than the third. — Thoracic legs of moderate length; second (fig. 6b) and third pairs in the main as in *L. polita*, but seventh joint with claw as long as or a little longer than sixth joint. Three posterior pairs (fig. 6g) in the main as in *L. polita*, but sixth joint almost longer than the seventh joint with its somewhat short claw.

Abdomen somewhat shorter than the three preceding segments combined (fig. 6a). Ventral side of the five anterior segments (fig. 6h) with rounded moderate protuberances; the moderately small pleopods and their setæ also nearly as in *L. polita*. Sixth segment somewhat shorter than the sum

of the three preceding segments. — Uropods (fig. 6h) a little longer than sixth segment, somewhat robust; peduncle thick, only a little longer than deep; endopod with first joint a little longer than the second and considerably longer than the exopod.

The animals are whitish or light yellowish and less shining than in *L. polita*.

Length of females with marsupium 2.7—3 mm., of a very large female without marsupium 3.3 mm.

Subadult Male. The antennulæ (fig. 6i) are considerably thicker than in the female; first joint only slightly longer than second and third joints combined, about twice as long as deep; second joint only a little less deep than the proximal part of the first joint and conspicuously less than half as long again as deep. — Abdomen longer than in the female, slightly longer than the three preceding segments combined. Pleopods larger and especially the exopods conspicuously longer with longer setæ than in the females. — Length 2.4—3.0 mm.

Remarks. *L. vicina* is allied only to *L. polita:* the best distinguishing characters between them are afforded by the joints of the chelipeds and by the much feebler armature of the incisive margins of the fingers of the chelæ in *L. vicina*.

The mouth-parts have been examined. The mandibles (fig. 6c) are slender and their molar processes are very different from those in the species of *Leptognathia* figured by Sars. Each molar process has the proximal half somewhat thicker than the distal; the end is rounded with three triangular teeth in front (fig. 6d) and posteriorly with several slender processes forming a comb. The maxillulæ (fig. 6e) are very slender, but the major part of the palp is somewhat inflated.

Occurrence. *L. vicina* has been taken by the "Ingolf" at two stations.

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 1 spec.

— — St. 28: Lat. 65° 14′ N., Long. 55° 42′ W., 420 fm., temp. 3.5°; 40 spec.

Besides it has been taken by Admiral C. Wandel in 1889 at the following place.

Davis Strait: Lat. 66° 49′ N., Long. 56° 28′ W., 235 fm., sand and ooze, temp. 4.4°; 1 spec.

Group d. *Uropods with the peduncle produced in a triangular protuberance probably answering to an exopod not marked off, endopod two-or one-jointed. Pleopods moderately well developed.*

Species 63—65.

This group is a very natural one, as its three species are allied to each other and differ in several features from all species of this genus described in the preceding pages. The chelipeds differ from those of all other species by the curiously shaped ischium and carpus; furthermore the basal joint has the whole oblique posterior margin attached to the cephalothorax. The three posterior pairs of legs are robust with seventh joint short and the claw very short.

63. **Leptognathia profunda** n. sp.

(Pl. X, figs. 1a—1h).

Female (without marsupium). Body slender, a little more than eight times as long as broad (fig. 1a) and with the abdomen almost broader than the thorax or the carapace. Carapace as long as the two following segments combined (fig. 1a), seen from above considerably longer than broad, feebly angular before the middle and in front more than half as broad as near the middle.

Antennulæ scarcely or a little shorter than the carapace (fig. 1b), moderately robust. First joint only a little longer than second and third joints combined, about twice as long as deep; second joint a little more than half as long as the first and a little produced above; third joint moderately long, with its lower margin as long as that of second joint; fourth joint almost as long as the second. — Antennæ with fourth and fifth joints completely fused.

Chelipeds (figs. 1 b and 1 c) moderately strong. Basal joint short, with its entire posterior margin very oblique and attached to the lower part of the side of cephalothorax nearly at its middle, thus very far from the lower front angle of second thoracic segment. Carpus half as long again as deep, somewhat triangular in aspect, with its postero-inferior margin long; the anterior margin uncommonly short. Chela not longer than the carpus, somewhat curved, almost two and a half times as long as broad with the posterior margin of the hand considerably concave; movable finger as long as the anterior margin of the hand, moderately broad; fixed finger with its posterior margin straight and with a single seta towards its base; this finger is somewhat broader than the movable and decreases gradually in breadth from the base to somewhat from the end, where a conspicuous, triangular tooth projects on the incisive margin, while the distal portion of the finger beyond that tooth is slender, straight and projects conspicuously when the fingers are closed; the movable finger has a long and strong sub-spiniform seta projecting from the inner side somewhat from the base; furthermore a long seta and two shorter setæ originate from the inner surface of the hand at the base of the fixed finger; when the fingers are closed no interval is found between their proximal halves.

Thoracic segments with their lateral margins considerably convex (fig. 1 a); second segment somewhat shorter than the third. — Second to fourth pairs of thoracic legs (fig. 1 b) moderately strong, subsimilar in shape but decreasing considerably in length from second to fourth pairs; second pair (fig. 1 d) with fourth and fifth joints subequal in length and their terminal setæ short; sixth joint somewhat longer than the fifth and as long as seventh joint with claw. Three posterior pairs (fig. 1 e) somewhat short and robust with their spines rather short; seventh joint short and the claw very short; both together much shorter than sixth joint.

Abdomen somewhat longer than the two preceding segments combined (fig. 1 a). Ventral margin of each of the five anterior segments somewhat convex. Pleopods somewhat large (fig. 1 g); both rami with a good number of plumose setæ (fig. 1 f) and many of them long; the setæ are found on the exopod along the whole, on the endopod along the distal half, of the outer margin. Sixth segment as long as the two preceding segments combined. — Uropods somewhat shorter than sixth segment; peduncle broad but distinctly longer than deep, with its lower produced part almost as long as the upper margin of the peduncle and terminating in a long seta and two short setæ (fig. 1 h); the endopod moderately robust, two-jointed, but the articulation is not very distinct; the second joint scarcely as long as the first and with a dorsal seta at the middle.

Length 2.2 mm.

Remarks. *L. profunda* differs from all preceding species of the genus by the characters enumerated for the group. Its differences from *L. latiremis* n. sp. are pointed out in the "Remarks" on this species.

Occurrence. It has been taken by the "Ingolf" at a single deep-sea station.

South-West of Cape Farewell: St. 22: Lat. 58° 10′ N., Long. 48° 25′ W., 1845 fm., temp. 1.4°; 3 spec.

64. **Leptognathia latiremis** n. sp.

(Pl. X, figs. 2a—2n).

Female (without marsupium) and subadult Male. Somewhat slender, about seven and a half times as long as broad, seen from above sybcylindrical, but the lateral margins of the thoracic segments considerably convex. — Carapace somewhat shorter than the two following segments combined (fig. 2a), not much longer than broad, subquadrangular but with all angles broadly rounded.

Antennulæ in the female only a little shorter than the carapace, somewhat varying in thickness (figs. 2b and 2c). First joint somewhat longer than the two following joints combined, about two and a half times as long as deep; second joint about half as long as the first and a little produced above; third joint considerably shorter than the second, while fourth joint is conspicuously longer than the second; in a subadult male the three proximal joints (fig. 2d) are considerably thicker in proportion to length and the fourth joint is much longer than the second and only a little shorter than the first. — Antennæ with fourth and fifth joints completely fused, about twice as long as the penultimate joint.

Chelipeds robust (fig. 2g). The basal joint as in *L. profunda;* ischium extremely broad, embracing more than half of the lower margin of the carpus. Carpus extremely deep, less than half as long again as deep. Chela a little longer than the carpus, twice as long as broad; the proximal third of the posterior margin very concave and the major part distinctly convex, with two setæ; the fixed finger is peculiarly shaped, the incisive margin to a little from the end being very convex and a little more than the distal half of this portion serrate with some more or less obtuse teeth; the terminal small part of the finger is shaped as an oblong, almost straight tooth; the movable finger is robust, but yet very conspicuously narrower than the proximal half of the fixed finger and considerably shorter than the anterior margin of the hand; when the fingers are closed a conspicuous strip of the movable finger is covered by the fixed finger, while at the base there may be seen a minute hole between the fingers; the inner side of the hand bears a long, spiniform seta and a similar seta originates from the inner surface of the movable finger.

Thoracic segments nearly as in *L. profunda.* All thoracic legs (figs. 2h—2k) in the main as in *L. profunda*, but in the anterior pairs fourth and fifth joints are shorter in proportion to thickness, sixth joint much longer than the fifth but slightly shorter than the seventh with claw.

Abdomen somewhat longer than the two posterior thoracic segments combined (fig. 2a). Pleopods (fig. 2l) with the rami well developed though smaller than in *L. profunda;* each ramus with setæ only on the terminal margin and the setæ are shorter than the rami and not plumose; in young specimens with the last pair of thoracic legs still wanting the pleopods are also wanting (fig. 2n). Sixth segment short, shorter than the two preceding segments combined and posteriorly broadly rounded (fig. 2m). — Uropods as long as the sixth segment (figs. 2m and 2n); peduncle broad but distinctly longer than broad, produced in a triangular plate, which is as long as or longer than the upper margin of the peduncle and its obtuse end bears one long and one short seta; endopod moderately robust, without any vestige of a division into two joints.

Length of the largest specimen from Stat. 58 is 2.5 mm., of the specimen from Stat. 24 2.8 mm.

Remarks. This species is distinguished from *L. glacialis* especially by the shape of the fixed

finger of the chelæ; from *L. profunda* it is distinguished by several features, among which may be pointed out the quite different shape of the fixed finger of the chela and the short and not plumose setæ of the pleopods.

Fig. 2 f represents the maxillipeds and fig. 2 e the mandibles of this species. The last-named figure shows that the mandibles are somewhat thick and their molar processes decrease slightly in thickness to the end, which is cut off very obliquely and adorned with about three teeth. The molar processes differ therefore materially from those in the species figured by Sars and remind one more of those in *L. ventralis* as described on p. 91, though differing in the armature of their end.

Occurrence. *L. latiremis* has been taken by the "Ingolf" at three stations.

East of Iceland: St. 58: Lat. 64° 25′ N., Long. 12° 09′ W., 211 fm., temp. 0.8°; 12 spec., but the majority juvenile without pleopods.

North of Iceland: St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 1 juv. spec.

— - — St. 124: Lat. 67° 40′ N., Long. 15° 40′ W., 495 fm., temp. ÷ 0.6°; 1 spec.

65. **Leptognathia glacialis** n. sp.

(Pl. X, figs. 3 a—3 b).

Female (without marsupium). This species, of which only a single specimen is at hand, is closely allied to *L. latiremis*, differing only in the shape of the chelæ and a little in the uropods. When the chela is seen vertically from the outer side (fig. 3 a) it is observed, that the major part of its posterior margin is considerably convex with two setæ, the incisive margin a little sinuate and its proximal half slightly concave with about seven rounded saw-teeth; the movable finger is very much narrower than the proximal third of the fixed finger and has a minute tooth near the middle of its incisive margin; when the fingers have their apical parts crossed a long and moderately broad interval is found between their incisive edges. The uropods (fig. 3 b) have the produced part of the peduncle considerably shorter and more rounded than in the two other species of group d.

Length of the specimen 2.8 mm.

Occurrence. This species has been taken by the II[d] Amdrup Expedition at East Greenland at a single locality.

Fleming Inlet: Lat. 71° 51′ N., Long. 22° 27′ W., 118 fm., red clay; 1 spec.

Haplocope G. O. Sars.

This genus, established on a single species, is so closely allied to *Leptognathia*, that it would perhaps be advisable either to cancel it or to divide *Leptognathia* into several genera. On p. 9 and 65—66 I have pointed out why I think it premature to subdivide the last-named genus, but as *Haplocope* has been established may years ago it might probably be nearly impossible to get it cancelled. *Haplocope angusta* G. O. Sars is a slender species with long uropods and the exopod of these appendages two-jointed; according to Sars it differs from *Leptognathia* in having the molar process of the mandibles

rather strong, cylindric and armed at the tip with dentiform tubercles, furthermore by having the pleopods uniramous without setæ. Dollfus has established a new species as *Haplocope (?) abyssorum,* but according to his figures I suppose that this species, which has no rami on the pleopods, does not belong to *Haplocope,* but either to *Leptognathia* or, and more probably, be the type for a new genus. — From the "Ingolf" I have a new species which is allied to *H. angusta* in the mandibles (fig. 4c) and in all other features of some importance excepting that the unimarous pleopods have very long setæ. I think that the best external character for *Haplocope* is that the pleopods are uniramous.

66. **Haplocope linearis** n. sp.

(Pl. X, figs. 4a—4f).

Female. Slender, between eight and eight and a half times as long as broad, tapering somewhat in breadth from the second thoracic segment to the end of abdomen (fig. 4a). — Carapace about as long as second segment plus half of the third, slightly narrower than second segment, not much longer than broad, about twice as broad behind the middle as at the front end and with the lateral margins very moderately convex.

Antennulæ (fig. 4b) much shorter than the carapace, somewhat robust. First joint somewhat shorter than the other joints combined, not fully twice as long as deep; second joint not quite half as long as the first and feebly produced above, only a little longer than the third and a little shorter than the fourth joint; longest terminal setæ about as long as the two distal joints combined. — Antennæ somewhat short, with fourth and fifth joints completely fused.

Chelipeds (fig. 4b) somewhat small. The basal joint with the posterior protuberance well developed, about as long as deep, with its rounded hind margin moderately distant from the lower front angle of second thoracic segment. Carpus considerably longer than the basal joint, twice as long as deep, with the lower margin considerably convex. Chela small, somewhat shorter than the carpus and somewhat more than twice as long as broad; movable finger as long as the anterior margin of the hand and towards the base much narrower than the fixed finger which has two long setæ on its straight posterior margin towards the hand.

The thoracic segments (fig. 4a) more or less distinctly angular, and on the second segment their lateral angles are situated far in front, on the following segments gradually more backwards, consequently on the seventh segment only a little from the posterior margin. Third segment is more than half as long again as the second, slightly longer than broad and slightly shorter than fifth segment. — Thoracic legs slender and subequal in length, moderately long. Second pair (fig. 4b) with fourth and fifth joints subequal in length and their terminal spines long; sixth joint not fully half as long again as the fifth and a little shorter than seventh joint with claw. Three posterior pairs (fig. 4d) with most of the spines moderately long and their sixth joint a little shorter than seventh with claw.

Abdomen slightly shorter than the two preceding segments combined and the first segment conspicuously narrower than the seventh thoracic segment. Five anterior segments with the ventral margins considerably or very moderately convex (fig. 4f). Pleopods (figs. 4e and 4f) long and narrow;

peduncle very oblong; the single ramus half as long again as the peduncle, about four times as long as broad, with the end cut off obliquely; on this terminal margin about seven fine, extremely long setæ are inserted, some of them about two and a half times as long as the ramus; no setæ are found on the lateral margins of the rami. Sixth segment as long as, or a little longer than, the two preceding segments together. — Uropods (fig. 4f) slender and long, from a little shorter to a little longer than the three posterior segments combined; peduncle long, about as long as the fifth segment and more than twice as long as deep; endopod with first joint a little or conspicuously longer than the second; exopod very slender, half as long as the endopod and with its two joints equal in length.

Length of a female with marsupium 2 mm.

Remarks. This small and slender species is easily distinguished from all North Atlantic or Arctic forms hitherto known by its long and uniramous pleopods with very long setæ.

The mandibles are shown in fig. 4c; a description is scarcely needed beyond that given in the remarks on the genus.

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

Davis Strait: St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; 12 spec.

Leptognathiella n. gen.

This genus is established on a new species which in a few features differs materially from *Leptognathia* and *Haplocope*.

The body is extremely slender. The four-jointed antennulæ differ from those of *Leptognathia* by having the second joint strongly produced above (Pl. X, figs. 5b and 5g) into a triangle overlapping a part of third joint; besides second joint, seen from the side (figs. 5d and 5g), increases in depth from the base to beyond the middle. (Mouth-parts unknown). Chelipeds normal, with the basal joint having the hind margin of the well developed posterior protuberance free and rounded. Thoracic legs built as in *Leptognathia*, short; three anterior pairs thick. Pleopods wanting in the female. Last abdominal segment with the posterior margin between the uropods feebly concave (fig. 5c); uropods extremely long, curved downwards, biramous (figs. 5f and 5i), with the endopod two-jointed, the short exopod one-jointed.

Remarks. Though the characters pointed out as generic are not very valuable, the aspect of the animal is so different from that of the forms of *Leptognathia* that the establishment of a new genus seemed to me to be necessary.

67. **Leptognathiella abyssi** n. sp.

(Pl. X, figs. 5a—5i).

Female (without marsupium). Body extremely slender, between ten and nine and a half times as long as broad (fig. 5a), broadest at the middle of the thorax which is a little broader than the carapace and somewhat broader than the abdomen. — Carapace about as long as the second plus

half of the third thoracic segment, considerably longer than broad (fig. 5b), at the front end somewhat more than half as broad as behind the middle; the lateral margins posteriorly somewhat convex, anteriorly a little concave.

Antennulæ (figs. 5b and 5d) nearly as long as the carapace, moderately strong. First joint slightly longer than the two next joints combined, somewhat more than twice as long as deep, somewhat produced above and before the middle considerably deeper than towards the end. Second joint extremely produced above, increasing in depth from the base to the end of the lower margin and its upper margin is nearly two-thirds as long as that of the first joint. Third joint considerably tapering, with the lower margin about twice as long as the upper; fourth joint slenderly conical, a little longer than the lower margin of third joint, considerably shorter than its terminal setæ. — Antennæ short, even a little shorter than the two proximal antennular joints combined; fourth and fifth joints completely fused.

Chelipeds (fig. 5g) somewhat robust. The basal joint even a little longer than the carpus, with the posterior protuberance large, as long as deep and its rounded hind margin reaching behind the anterior lower end of second thoracic segment. Carpus nearly ovate, slightly more than half as long again as deep. Chela a little longer than the carpus, about twice as long as broad, with the major part of its posterior margin straight and furnished with two long setæ; movable finger almost as long as the anterior margin of the hand and towards the base much narrower than the fixed finger.

Lateral margins of the thoracic segments (fig. 5a) not angular but evenly and moderately convex. Second segment somewhat shorter than the third which is slightly shorter than the fifth or the sixth. — Thoracic legs short. The two anterior pairs uncommonly thick (fig. 5g); third joint with a very long, spiniform seta from the posterior angle; fourth and fifth joints very thick; subequal in length and with the terminal spines long or rather long; sixth joint considerably longer than the fifth and slightly longer than seventh with claw. Three posterior pairs somewhat slender (fig. 5e) with their spines well developed; fifth joint even longer than the sixth and slightly longer than seventh without claw.

Abdomen a little shorter than the two preceding segments combined. Five anterior segments (fig. 5f) with the ventral margin moderately convex; pleopods wanting. Sixth segment (fig. 5c) scarcely as long as the two preceding segments combined, transverse, with the hind margin long and a little concave. — Uropods, inserted on the postero-lateral angles which are cut off obliquely, are only a little shorter than the five posterior segments combined and somewhat robust; the peduncle as long as the sixth segment, seen from the side (fig. 5f) curved a little downwards, with the lower margin concave; endopod curved downwards as the peduncle, almost thicker a little from the end than near the base, two-jointed, with the second joint more than twice as long as the first; exopod slender, as long as the first joint of the endopod, one-jointed.

Length of a female without marsupium 2 mm.

Subadult Male. Similar to the female in most features, but differing in some particulars. — The antennulæ (fig. 5g), especially their two proximal joints, somewhat thicker than in the female. — Three posterior pairs of legs (fig. 5h) have the seventh joint and the claw considerably longer than in the female, subequal in length and together twice as long as sixth joint. — Abdomen (fig. 5i)

a little longer than the two preceding segments combined; pleopods well developed, biramous, with the exopod much longer than the peduncle and its terminal setæ about as long as the pleopod. — Length 2.1 mm.

Remarks. This small and very slender species is easily distinguished from all other forms by its very long and peculiarly shaped uropods.

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

South-West of Cape Farewell: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 3 spec.
— - — — St. 22: Lat. 58° 10′ N., Long. 48° 25′ W., 1845 fm., temp. 1.4°; 1 spec.

Cryptocope G. O. Sars.

This genus was established in 1880 on two species, *C. abbreviata* G. O. Sars and *C. Voringii* G. O. Sars. *C. abbreviata* must be considered the type, at it was described several years before the other species and by Sars placed before *C. Voringii*, when he established the genus. Later I established *C. arctica* which is related to *C. abbreviata*. Norman & Stebbing established *Strongylura arctophylax*, which is nearly related to *C. Voringii* and must be transferred to *Cryptocope*. This genus is closely related to *Leptognathia*, the only important difference between the two genera being the existence of four pairs of marsupial lamellæ in *Leptognathia* and only a single pair in *Cryptocope*. But females with marsupium are known only of *C. abbreviata* and *C. arctica*, while they are unknown not only of *C. arctophylax* but of *C. Voringii*, as far as I may infer from Sars' detailed description of this species. But the genus may be divided into two groups, the first comprising *C. abbreviata* and *C. arctica*, which are small and very thick species and besides closely allied, the second group comprising *C. Voringii* and *C. arctophylax*, both large, less robust and closely allied but differing much in the relative length of the thoracic segments and in general aspect from the two other species. As the marsupium is unknown in these two large species it may be somewhat uncertain whether they have only a single pair of marsupial lamellæ, and if in the future that should prove not to be the case, these two species must be removed from *Cryptocope* and a new genus be formed for them. But at least provisionally they may be referred to *Cryptocope*.

68. Cryptocope arctica H. J. Hansen.

(Pl. XI, figs. 1 a—1 h.)

! 1886. *Cryptocope arctica* H. J. Hansen, Dijmphna-Togtets zool.-bot. Udbytte p. 209, Tab. XXI, fig. 4.
1887. — — — Vidensk. Medd. naturhist. Forening i Kjobenhavn for 1887, p. 180, Tab. VII, Fig. 1—1 c.

Female. Extremely thick (fig. 1 a), from four to four and a half times as long as broad. — Carapace extremely large (fig. 1 a), only a little shorter than the four following segments combined, somewhat longer than broad, at the front end scarcely half as broad as somewhat behind the middle, with the lateral margins somewhat convex.

Antennulæ somewhat long in proportion to the animal (fig. 1 a), being somewhat more than half as long as the carapace and rather slender (fig. 1 b). First joint somewhat shorter than the other joints combined, slightly more than twice as long as deep and a little more than twice as long as the second which is not produced above; third joint a little longer than deep, rectangular and considerably shorter than the second; fourth joint uncommonly long, as long as second and third joints combined, slender; longest terminal seta nearly as long as the three distal joints combined. — Antennæ with fourth and fifth joints completely fused without any vestige of an articulation, about twice as long as the penultimate joint.

Chelipeds (figs. 1 b and 1 c) somewhat large and moderately strong. Basal joint posteriorly produced into a considerable free portion bent much upwards and reaching distinctly behind the carapace. Carpus somewhat less than twice as long as deep, nearly oblong-ovate, with the lower margin considerably convex. Chela somewhat longer than the carpus, long and somewhat slender, being a little less than three times as long as broad, with two long setæ near the middle of the concave posterior margin and with the hand distinctly narrower at the base of the movable finger than near the middle; movable finger considerably or rather much shorter than the anterior margin of the hand, only a little narrower than the fixed finger (fig. 1 c), the incisive margin of which is somewhat sinuate, showing two flatly vaulted and badly defined protuberances.

Thoracic segments (fig. 1 a) with their lateral margins very convex, producing deep incisions between the segments; some of them are subangular. Second to fourth segment short, increasing in length backwards, together about as long as the sum of the fifth and the sixth; second segment decreases considerably in breadth from near the front to the posterior end; third segment is broadest somewhat before, and fourth a little before, the middle, while the three posterior segments are broadest behind their middle. Fifth segment is almost broader than the second and somewhat broader than the fourth or the seventh. — Thoracic legs (figs. 1 b and 1 d) long and slender; the anterior pair have the joints from the fourth to the sixth somewhat increasing in length, and the sixth joint, which is slender and long, is a little longer than seventh with claw. Posterior pairs (fig. 1 d) have the spines of moderate length; sixth joint is very long and considerably or much longer than seventh with claw.

Abdomen somewhat longer than the two preceding segments combined (fig. 1 a), seen from above tapering considerably backwards to the posterior margin which has a very obtuse angle; four posterior segments each with a pair of sublateral setæ (figs. 1 a and 1 e). Ventral side of the five anterior segments (figs. 1 e and 1 f) strongly serrate, as each segment bears a high, subtriangular or subquadrangular protuberance. Pleopods generally small and their rami terminating in some moderately long setæ (fig. 1 e); in the largest specimens from the "Ingolf" Stat. 25 the pleopods are very small (fig. 1 f) and their setæ nearly rudimentary. Sixth segment longer than the two preceding segments combined. — Uropods small; peduncle short and much deeper than long, thick; the endopod with its two joints equal in length; exopod more than half as long as the endopod, more or less distinctly two-jointed, with the joints subequal in length.

Length of females with marsupium 1.67—2 mm.

Subadult Male. Conspicuously more slender and distinctly smaller than adult females. — Antennulæ (fig. 1 g) considerably thicker than in the female; first joint somewhat less than twice as

long as deep. — Five anterior abdominal segments (fig. 1 h) proportionately longer than in the females, with the pleopods somewhat long, well developed.

Remarks. *C. arctica* is allied and rather similar to *C. abbreviata* G. O. S., but according to Sars' text and figures and my examination of a Norwegian specimen given by him *C. abbreviata* is smaller than *C. arctica*, its pleopods have no setæ on the end of their rami, the exopod of the uropods is one-jointed and, what is of special importance, the chelipeds are rather different, having the carpus only one-third as long again as deep and the chela distinctly broader, two and a half times as long as broad, with a single setæ on the posterior margin.

In vain I have looked for differences of possibly specific value between the specimens from my very different localities; my type from the Kara Sea agrees completely with the specimens from East Greenland and from the "Ingolf" Stations. — Some among the specimens from the "Ingolf" Stat. 25 are larger than the others and, as already stated, have the pleopods less developed than all other specimens seen, but no other difference could be discovered.

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

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 11 spec.
— — St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; 29 spec.
— — St. 24: Lat. 63° 06′ N., Long. 56° 00′ W., 1199 fm., temp. 2.4°; 1 spec.
— — St. 36: Lat. 61° 50′ N., Long. 56° 21′ W., 1435 fm., temp. 1.5°; 7 spec.
Denmark Strait: St. 90: Lat. 64° 45′ N., Long. 29° 06′ W., 568 fm., temp. 4.4°; 4 spec.
South-West of Iceland: St. 81: Lat. 61° 44′ N., Long. 27° 00′ W., 485 fm., temp. 6.1°; 1 spec.
— - — St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 27 spec.
East of North-Iceland: St. 101: Lat. 66° 23′ N., Long. 12° 05′ W., 537 fm., temp. ÷ 0.7°; 1 spec.
North of East-Iceland: St. 126: Lat. 67° 19′ N., Long. 15° 52′ W., 293 fm., temp. ÷ 0.5°; 4 spec.

Furthermore this species has been taken at a number of arctic localities on both sides of Greenland, especially East-Greenland, and off Jan Mayen by various Expeditions.

Baffin Bay: Lat. 72° 20′ N., Long. 59° 39′ W., 170 fm., clay with stones; 1 spec. "Ingegerd och Gladan" 1871. (H. J. Hansen).
East Greenland: Henry Land: Lat. 69° 34′ N., Long. 23° 35′ W., 20 fm.; 17 spec. II^{d} Amdrup Exp.
— — Hurry Inlet: Lat. 70° 36′ N., Long. 22° 31′ W., 50 fm.; 2 spec. - — —
— — — — 10 fm.; 1 spec. - — —
— — Forsblad Fjord: Lat. 72° 27′ N., Long. 25° 28′ W., 90—40 fm.; 1 spec. II^{d} Amdrup Exp.
— — Stormbugt, ca. Lat. 77° N., 15—20 fm.; 1 spec. Danmark Exped. (Steffensen).
Jan Mayen: 50—60 fm.; 1 spec. II^{d} Amdrup Exped.

Distribution. The type of *C. arctica* was taken in the Kara Sea, 64 fm. (H. J. H.). Later Stebbing has mentioned specimens from Novaia Zemlia or Spitzbergen, 100 fm. Recently it has been mentioned by Sars from the Gaase Fjord, Ellesmere Land (at ab. Lat. 78° N., on the western side of Smith Sound), 60 m. (2^{d} Fram Exped.).

The geographical and bathymetrical distribution of this species is very interesting. In the Kara Sea, at East Greenland, Jan Mayen and in Smith Sound it has been taken in depths between

10 and 90 fathoms; in the cold area it was taken by the "Ingolf" at two stations, 293 and 537 fm.; in the warm area by the "Ingolf" at seven stations at depths varying from 318 to 1435 fathoms.

69. **Cryptocope Voringii** G. O. Sars.

(Pl. X, figs. 6a—6d.)

1877. *Tanais Voringi* G. O. Sars, Arch. for Math. og Naturv. B. II, p. 347.
1881. *Cryptocope Voringii* — Arch. for Math. og Naturv. B. VII, p. 50.
! 1885. — — — Den norske Nordhavs-Exp., Crust. I, p. 74, Pl. VII, figs. 5—16.

Female (without marsupium). G. O. Sars has published a very detailed description with several figures of this sex, but a number of observations may be added.

Body, carapace, thoracic segments and abdomen, seen from above, as to all particulars nearly as in *C. arctophylax* Norm. & Stebb. (comp. description and fig. 2a on Pl. XI of this species).

Antennulæ (fig. 6a) somewhat shorter than the carapace, moderately slender. First joint considerably shorter than the three other joints combined, about two and half times as long as deep and feebly tapering; second joint distinctly less than half as long as the first and considerably produced above; third joint somewhat shorter than the second, almost quadrangular; fourth joint long, nearly as long as third and second joints combined. — Antennæ somewhat long; fourth and fifth joints completely fused.

Chelipeds robust (fig. 6a). A coxal joint is well marked off, large, somewhat triangular and well chitinised on the outer side. Basal joint posteriorly produced into a moderately long, free, moderately thick protuberance directed backwards and upwards, and the hind margin of this protuberance is situated beneath the front margin of second thoracic segment. Carpus only somewhat longer than deep, being somewhat expanded downwards and showing a somewhat protruding triangle below at the front lower angle of the ischium. Chela almost half as long again as the carpus, robust, only a little more than twice as long as broad; movable finger somewhat shorter than the anterior margin of the hand, robust, with a conspicuous, subtriangular and moderately low tubercle at the middle of the incisive margin (fig. 6b); fixed finger somewhat thicker than the movable, with three setæ on its posterior margin, while its incisive margin has a large, broad and somewhat high, rounded tubercle beyond the middle and before the middle a low and badly defined protuberance; both fingers with their end obtuse.

Thoracic legs rather long and slender, with their spines short or moderately short. Anterior pairs (fig. 6c) with the joints increasing much in length from the fourth to the sixth; sixth joint very long and slightly longer than seventh with claw. Posterior pairs as in the next species (vid. infra).

Abdomen (fig. 6d) somewhat shorter than the three preceding segments combined. Five anterior segments with their ventral surface peculiarly armed; first segment with the ventral process somewhat short, obliquely and obtusely triangular; process of second segment long, longer than broad, obliquely triangular, somewhat curved and directed much backwards; the processes decrease much in length from second to fourth segment, while the process on fifth segment is only a moderately low, rounded tubercle. Pleopods very small, biramous, without setæ. (In juvenile specimens with the seventh pair

of thoracic legs not developed the pleopods and the ventral processes are not found). Sixth segment about as long as fifth, fourth and half of the third segment combined. — Uropods (fig. 6d) small and robust; both rami distinctly two-jointed (also in juvenile specimens) and the exopod somewhat shorter and much thinner than the endopod.

Length of the single larger specimen 4 mm.; Sars stated that the female is 5.5 mm. long.

Remarks. The differences between the females of *C. Voringii* and *C. arctophylax* are pointed out in the "Remarks" on the latter species. Sars stated that the uropods of the female have the exopod one-jointed, but this is decidedly incorrect; his figure of the chela is not good, and he has described and figured (figs. 5 and 6) the terminal part of the thoracic legs, viz. seventh joint with claw, quite erroneously.

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

North-West of the Færoes: St. 138: Lat. 63° 26′ N., Long. 7° 56′ W., 471 fm., temp. ÷ 0.6°; 1 large spec.
South of Jan Mayen: St. 117: Lat. 69° 13′ N., Long. 8° 23′ W., 1003 fm., temp. ÷ 1.0°; 1 juven. spec.
— - — St. 116: Lat. 70° 05′ N., Long. 8° 26′ W., 371 fm., temp. ÷ 0.4°; 1 juven. spec.

Distribution: The specimens seen by Sars had been taken at three places in the cold area West of Norway, from Lat. 63° 10′ to Lat. 67° 56′ N., and in depths ranging from 350 to 778 fathoms; temperatures at the bottom from ÷ 1.0° to ÷ 1.4°.

70. **Cryptocope arctophylax** Norm. & Stebb.

(Pl. XI, figs. 2a—2k).

1886. *Strongylura arctophylax* Norman & Stebbing, Transact. Zool. Soc. London, Vol. VII, Pt. IV, p. 116, Pl. XXIV, fig. 3.

Young Female and subadult Male. Body of the subadult male (fig. 2a) robust, slightly more than five times as long as broad and the anterior half conspicuously broader than the posterior; the young female is about five and a half times as long as broad. — Carapace nearly as long as the two following segments combined, as long as or slightly longer than broad, anteriorly somewhat less than half as broad as behind the middle, where the lateral margins are very convex.

Antennulæ in the subadult male (fig. 2a) a little, in the young female somewhat, shorter than the carapace. In the female (fig. 2e) the antennulæ are somewhat slender; first joint considerably shorter than the three following joints combined, somewhat less than three times as long as deep and feebly tapering; second joint somewhat produced above, not fully half as long as the first, but much longer than the third which is a little shorter above than below; fourth joint almost as long as third and second joints combined and a little longer than the terminal setæ. In the subadult male the antennulæ (fig. 2b) are much thicker; first joint slightly more than half as long again as deep; second joint as deep as the length of its upper margin, which is half as long as the first joint; third joint more than half as deep again as the length of its upper margin; fourth joint uncommonly long, conspicuously longer than the two preceding joints combined, with the proximal portion somewhat thickened, and the terminal setæ are considerably shorter than the joint. Antennæ somewhat long, in the young female (fig. 2e) with, in the subadult male without, a vestige of an articulation between fourth and fifth joints.

Chelipeds robust and on the whole agreeing with those in *C. Voringii* excepting in the armature of the fixed finger (fig. 2 c), which has the distal large tubercle furnished with two incisions dividing its margin into three rounded teeth, and the proximal protuberance is higher and better defined than in *C. Voringii;* in my specimens both fingers have their ends acute, while they are obtuse in my female of *C. Voringii.*

Thoracic segments (fig. 2 a) decrease distinctly in breadth from second to sixth. Second segment is slightly shorter than the third which is as long as the fourth and only slightly shorter than the fifth. Second to fourth segments increase conspicuously in breadth from their posterior to the anterior, rather broadly rounded angle, while fifth and sixth segments are subrectangular with their angles rounded and the lateral margins feebly protuberant behind the middle; seventh segment broader behind than in front. — The thoracic legs as in *C. Voringii;* fig. 2 d shows that in the posterior pairs sixth joint is considerably longer and thinner than the fifth and distinctly longer than seventh with claw; fig. 2 f shows that the upper terminal spine on sixth joint is strong and adorned with some five pairs of lateral, oblique branches (a somewhat similar spine is found in *C. Voringii).*

Abdomen in the subadult male (fig. 2 a) as long as the three preceding segments combined; its anterior half is as broad as seventh thoracic segment, but from the fourth segment the abdomen tapers conspicuously; in the young female the last thoracic segment has not arrived at full size and the abdomen is somewhat narrower than sixth segment, slightly longer than fifth and sixth segments combined and not tapering, as the sixth segment is fully as broad as the first. In the male (fig. 2 d) the armature of the ventral side is strongly developed; the process from third segment is very long, acute, subtriangular, with the anterior margin a little convex and the posterior margin somewhat concave, directed mainly downwards; the process from second segment is much shorter than the third though still large, triangular and as long as broad; the first segment has only a somewhat low, triangular tubercle, fourth segment a somewhat higher tubercle, and on the fifth segment the protuberance is rudimentary. In the young female the processes (fig. 2 g) or tubercles are conspicuously less developed, but show nearly the same relative proportions as to length. Pleopods completely wanting in the female, while in the subadult male they are well developed (fig. 2 d), somewhat long, biramous, with moderately long setæ. — Uropods (figs. 2 d and 2 g) distinctly more slender and longer than in *C. Voringii;* peduncle at least as deep as long; endopod with the two joints subequal in length; exopod two-jointed, somewhat shorter and considerably thinner than the endopod.

Length of the subadult male 3.8 mm., of the young female 3.3 mm. (The female specimen described by Norman & Stebbing was 4 mm. long).

Adult Male (figs. 2 h—2 k). On the whole somewhat reminding of males of the genus *Leptognathia.* — Antennulæ (fig. 2 h) as long as the carapace and second thoracic segment combined, seven-jointed. First joint twice as long as deep; second joint thick and slightly more than half as long as the first; third and fourth joints very short and fifth joint short, all three somewhat cup-shaped and fourth and fifth joints each with a close row of extremely long sensory hairs; sixth joint about as long as the four preceding joints combined, at the end with a row of very long sensory hairs; seventh joint long, nearly as long as the first and much thinner than the sixth, slightly longer than the terminal setæ.

Chelipeds (fig. 2 h) moderately strong, somewhat long. The coxal joint is distinctly marked off; the basal joint is very thick, only a little shorter than the carpus, which is a little less than twice as long as deep. Chela considerably longer than the carpus, inconsiderably more than twice as long as broad (fig. 2 i); movable finger almost as long as the anterior margin of the hand and distally much curved, and the major middle portion of its incisive margin is irregular with several moderately small or very small teeth and two minute spines; the fixed finger has nearly the proximal half of its incisive margin finely serrate, while the distal half has the two protuberances found in the immature male, but both are lower and the distal protuberance without marginal incisions and teeth excepting a single small, acute tooth at its end and just at the origin of the terminal, oblong-triangular, acute part of the finger.

Thoracic legs long and slender (fig. 2 h), subsimilar in all particulars excepting that the spines on the anterior pairs are very short, on the posterior pairs somewhat more developed; sixth joint is very long and considerably longer than seventh with claw.

Abdomen (fig. 2 k) somewhat longer and, as usually, conspicuously thicker than the thoracic segments. Five anterior segments with ventral tubercles; the tubercle on third segment triangular but almost twice as broad as high; from that segment the protuberances decrease in size both forwards and backwards and all are somewhat or fully rounded. Pleopods strong with very long setæ. — Sixth segment strongly produced backwards in a somewhat slender process with the upper margin distinctly concave; the result is that the uropods originate considerably before the middle of the segment and terminate before its end. — Uropods (fig. 2 k) with the peduncle about as long as deep; endopod three-jointed, with first joint thicker and much shorter than the second, which is a little shorter than the third; exopod very slender and as long as the sum of two proximal joints of the endopod, two-jointed, the first joint very short, the second long.

Length 3.8 mm.

Remarks. *C. arctophylax* is allied to *C. Voringii*, but the female and the subadult male of the two species differ sharply in the ventral abdominal processes, the third process being much longer than the others in *C. arctophylax*, while in *C. Voringii* the second process is the longest; furthermore the female of *C. Voringii* has small pleopods without setæ, while in the female *C. arctophylax* pleopods seem to be wanting; a third character is the difference in the above-described distal tubercle on the incisive margin of the fixed finger of the chelæ. — According to the figures of the male of *C. Voringii* published by Sars this animal seems to differ sharply from the male of *C. arctophylax* by having the first joint of both endopod and exopod of the uropods much longer in proportion to the second joint than in the last-named species, and in *C. Voringii* the terminal joint of the antennulæ is only somewhat longer than sixth joint, while in *C. arctophylax* the seventh joint is more than twice as long as the sixth.

C. arctophylax was established by Norman & Stebbing on a single female specimen; they referred, however, the species wrongly to the genus *Strongylura*, but it must be emphasized that their work was written before any figure of *Cryptocope Voringii* G. O. S. or *Strongylura cylindrata* G. O. S. had been published. Stebbing's figures of the animal from above, of the cheliped, thoracic legs, etc., leave no doubt that the animal is either *C. Voringii* or *C. arctophylax* as defined here; the locality for the specimen and the ventral abdominal process shown on his fig. III Pl. but not mentioned in the

text shows that the animal cannot be *C. Voringii*. One small error may be noted, viz. that the English authors stated the exopod of the uropods to be unjointed, while it certainly is two-jointed.

Occurrence. *C. arctophylax* has been taken by the "Ingolf" at two deep-water stations in the warm area.

Davis Strait: St. 24: Lat. 63°06′ N., Long. 56°00′ W., 1199 fm., temp. 2.4°; 1 subadult male, 1 young female and 1 juvenile specimen.

— — St. 36: Lat. 61°50′ N., Long. 56°21′ W., 1435 fm., temp. 1.5°; 1 adult male and 1 mutilated juvenile specimen.

Distribution. The only specimen mentioned in the literature is the type, which has been dredged by the "Porcupine" at Lat. 56°24′ N., Long. 11°49′ W., "midway between Ireland and Rockall", 1380 fathoms. — *C. arctophylax* has only been found in the warm area, while *C. Voringii* is confined to the cold area.

Tanaella Norm. & Stebb.

This genus was established on a single specimen of a new species, *T. unguicillata* Norm. & Stebb., and I possess a specimen of this species and a specimen of a hitherto unknown form; all three specimens hitherto known are females without marsupium. The genus is related to *Leptognathia* but differs in some particulars. A brief description of the genus may be given here.

Body somewhat robust. The antennulæ have the second joint longer than third and fourth joints combined, and the third joint is very short. Chelipeds unusually robust. Anterior pairs of thoracic legs have the rather long sixth joint longer than the seventh with claw; while on the posterior pairs sixth joint is considerably shorter than seventh with claw. Five anterior abdominal segments very short and peculiarly shaped so that they, seen from the side, are somewhat angularly bent at the median lateral line; sixth segment long, at least as long as the four preceding segments combined. Pleopods either small without setæ or wanting. Uropods robust, with a styliform, unjointed endopod and no exopod. (Mouth-parts, marsupium and male unknown).

Remarks. *Tanaella* is related to *Strongylura* in having the sixth abdominal segment very long in proportion to the five anterior segments, but the whole abdomen in *Tanaella* is shorter in proportion to the thorax than in *Strongylura*. In the diagnosis of *Tanaella* Norman & Stebbing stated that no pleopods are found, but this feature cannot be maintained as a generic character, because my new species *T. ochracea* is closely allied to *T. unguicillata* excepting in the single feature, that it possesses small pleopods. The structure of the uropods seems to be a good character; besides the antennulæ and the elongate terminal part of the posterior pairs of legs seem to afford generic characters.

71. Tanaella ochracea n. sp.

(Pl. XI, figs. 3a—3f.)

Female (without marsupium). Moderately robust (fig. 3a), a little more than six times as long as broad, subcylindrical, tapering slightly in breadth from the carapace to sixth abdominal segment, which is conspicuously broader than the preceding abdominal segments. — Carapace somewhat longer

than the two following segments combined, somewhat longer than broad, at the front end half as broad as a little behind the middle; the lateral margins considerably convex; the frontal process triangular, broad and of moderate length.

Antennulæ (fig. 3b) a little shorter than the carapace, somewhat robust. First joint slightly longer than the three other joints combined, more than two and a half times as long as deep and with the proximal third rather expanded below. Second joint moderately produced above, conspicuously more than half as long as the first and somewhat longer than third and fourth joints combined, increasing distinctly in depth from the base to the end; third joint very short and fourth joint uncommonly short and somewhat robust; terminal setæ somewhat or considerably longer than fourth joint. — Antennæ long; fourth and fifth joints completely fused and conspicuously more than twice as long as the penultimate joint.

Chelipeds robust (fig. 3b). Basal joint long, even distinctly longer than the carpus; the posterior protuberance is very deep and its free, rounded hind margin reaches the front lower angle of second thoracic segment. Carpus ovate, scarcely half as long again as deep, ovate. Chela considerably longer than the carpus, twice as long as broad; movable finger much shorter than the anterior margin of the hand, strong, with a broad, very low, very flatly triangular protuberance on the incisive margin somewhat from its base (fig. 3c) and a minute, sharp denticle at the distal end of that protuberance; fixed finger very broad, with two strong setæ on the posterior margin, while the incisive margin has at the base a somewhat deep and moderately narrow, not crenulated incision producing a small hole between the fingers when the chela is closed; beyond that incision the margin is somewhat undulate to rather near the end where it has a sharp tooth and beyond this a conspicuous incision; the terminal part of the finger is an oblong and somewhat curved triangle with the end acute.

Thoracic segments (fig. 3a) increase gradually in length from the second to the fifth; the lateral margins of each segment are nearly straight excepting at both ends, but the margins of seventh segment are somewhat convex. — Thoracic legs somewhat short. The two anterior pairs (fig. 3b) moderately slender, fourth joint with a rather long spine on the posterior angle; fifth joint a little longer than the fourth, with the anterior distal spine long and the posterior spine much shorter; sixth joint with fine denticles along the posterior margin and on the end (fig. 3d), considerably longer than the fifth and a little longer than seventh with the straight claw. Three posterior pairs moderately strong, with somewhat long spines on the fourth and especially on fifth and sixth joints (fig. 3e); sixth joint somewhat longer than the fifth but much shorter than the seventh with claw, the seventh joint being long but yet shorter than the very long claw, and both are finely ciliated below.

Abdomen somewhat shorter than the three preceding segments combined (fig. 3a). Five anterior segments short, scarcely as broad as the posterior thoracic segments, seen from the side (fig. 3f) a little angularly bent at the lateral margin; the ventral side with somewhat low, rounded protuberances. Pleopods very small, biramous, without setæ. Sixth segment even perceptibly longer than the sum of the four preceding segments, seen from above (fig. 3a) broader than these segments and with the posterior margin and the lateral margins together evenly curved like the greater part of a circle. — Uropods a little shorter than sixth segment (fig. 3f); peduncle somewhat longer than deep; endopod about twice as long as the peduncle, styliform.

The body is shining and its anterior half deeply reddish yellow.

Length of the single specimen 3.0 mm.

Occurrence. It has been taken at the deepest "Ingolf" station.

South-West of Cape Farewell: St. 38: Lat. 59° 12′ N., Long. 51°05′ W., 1870 fm., temp. 1.3°; 1 spec.

Remarks. *T. ochracea* differs from *T. unguicillata* Norm. & Stebb. especially in the shape of the incisive margins of the chelæ, the shape of the five anterior abdominal segments when seen from the side, the shape of the last segment from above and by possessing small pleopods.

72. **Tanaella unguicillata** Norm. & Stebb.

(Pl. XI, figs. 4a—4d.)

1886. *Tanaella unguicillata* Norman & Stebbing, Tranact. Zool. Soc. London, Vol. XII, Pt. IV, p. 118, Pl. XXIV, fig. IV.

Female (without marsupium). The single specimen is so strongly curved that it was impossible to straighten it without breaking. But it seems to differ slightly from *T. ochracea* as to the general shape of the body, outline and relative length of the carapace and thoracic segments (comp. fig. IV D in the English paper quoted.)

Antennulæ (fig. 4a) somewhat shorter than the carapace, but otherwise almost as in *T. ochracea*, the most important difference being, that the second joint is proportionately a little longer and cylindrical, considerably more than half as long as the first joint and a good deal longer than the two distal joints together. — Antennæ with a feeble articulation between fourth and fifth joints, which are more than three times as long as the penultimate joint.

Chelipeds very robust (figs. 4a and 4b). The basal joint not fully as long as the carpus, very deep, with the hind margin of the deep posterior protuberance very flatly convex. Carpus not quite half as long again as deep. Chela somewhat longer than the carpus, distinctly less than twice as long as broad; movable finger much shorter than the anterior margin of the hand, with a somewhat high, triangular protuberance on the incisive margin somewhat from its base and a minute, sharp denticle just beyond that protuberance (fig. 4b); fixed finger very broad, with two strong setæ on its posterior margin, while its incisive margin has at the base a somewhat deep and long incision crenulated with some five or six obtuse saw-teeth, producing a small hole between the fingers when adduced, and beyond that incision the margin is somewhat undulate to rather near the end, where a very obtuse angle and beyond this a triangular incision are seen; the ends of both fingers are obtuse.

Three anterior pairs of thoracic legs (fig. 4a) proportionately more slender than in *T. ochracea* and decreasing conspicuously in length from second to fourth pair; fourth and fifth joints subequal in length and with the length of their spines as in *T. ochracea*; sixth joint much longer than the fifth or the seventh with its straight claw. Three posterior pairs (fig. 4c) nearly as in *T. ochracea*; seventh joint with its long claw much longer than the sixth joint, finely ciliated and nearly straight or curved distinctly upwards.

Abdomen only a little shorter than the three preceding segments combined, seen from the side (fig. 4d) uncommonly thick and thickest a little before the middle. Five anterior segments short, seen

from the side with their vertical margins most curiously bent twice at the lateral margin. Pleopods wanting. Sixth segment even a little longer than the four preceding segments combined; its posterior margin is not broadly rounded as in *T. ochracea* but a little produced behind with a somewhat obtuse angle. — Uropods much shorter than the sixth segment, thus somewhat shorter than in *T. ochracea*, with the endopod not quite twice as long as the peduncle, but otherwise nearly as in the last-named species.

The animal is somewhat light greyish.

Length of the single specimen about 3.2 mm, thus a little larger than that of the English authors.

Remarks. The specimen described belongs unquestionably to *T. unguicillata*; especially the shape of the proximal parts of both fingers of the chelæ and the lateral view of the abdomen as compared with Stebbing's figures proves that beyond doubt. The main differences between *T. ochracea* and *T. unguicillata* have been pointed out in the "Remarks" on the first-named species.

Occurrence. It has been taken by the "Ingolf" at the following place.

South of West-Iceland: St. 69: Lat. 62° 40′ N., Long. 22° 17′ W., 589 fm., temp. 3.9°; 1 spec.

Distribution. The type of Norman & Stebbing was dredged by the "Porcupine" on the slope of the English Channel, Lat. 49° 7′ N., Long. 10° 57′ W., 96 fathoms. No other specimen has been recorded in the literature.

Strongylura G. O. Sars.

This genus was established on a single species, *S. cylindrata* G. O. S., of a peculiar aspect. This form is in most characters allied to species of *Leptognathia* with the pleopods rudimentary or wanting, but it differs by having the abdomen in the female and the subadult male extremely long, only somewhat shorter or even as long as the five posterior thoracic segments combined, while the sixth abdominal segment is extremely long, at least a little longer than the three preceding segments combined, and the biramous uropods are small and thick. Furthermore it differs from *Leptognathia* and reminds of *Cryptocope arctica* and *Tanaopsis* in having third and fourth thoracic segments each conspicuously shorter than the fifth or the sixth segment, the three anterior segments together being in reality scarcely as long as the sum of fourth and fifth segments.

The "Ingolf" material contains two species which I refer to *Strongylura*; one of them is less characteristic than *S. cylindrata*, while the other species is somewhat difficult, but after long hesitation I have referred it to *S. cylindrata*.

Cryptocope arctophylax, established by Norman & Stebbing as a species of *Strongylura*, differs widely from this genus but is, as already stated, allied to *Cryptocope Voringii* G. O. S. No other species hitherto described has been referred to *Strongylura*.

73. Strongylura cylindrata G. O. Sars.

(Pl. XII, figs. 1a–1l.)

1881. *Strongylura cylindrata* G. O. Sars, Archiv for Math. og Naturv., B. VII, p. 53.

! 1896. — — — Account Crust. Norway, Vol. II, p. 36, Pl. XVI, fig. 1.

In the last-named work Sars has given a good representation of this species, viz. figures of a female without marsupium from above and from the side, together with drawings of appendages. He presented the Copenhagen Museum with two of his co-types, but they differ in some points and especially in the antennulæ from his figures and description. A comparison between my fig. 1 g, drawn from one of his co-types, with his figures on Pl. XVI shows, that the antennulæ are much more slender than figured by Sars and above all that the moderately slender terminal joint is slightly shorter than the two preceding joints combined, while according to Sars that joint is much shorter than the sum of the two preceding joints and very thick. Furthermore my figures of second and sixth legs (figs. 1 h and 1 i) as compared with Sars' figures of second and seventh legs show that the thoracic legs drawn by him have the joints conspicuously shorter in proportion to thickness than in my Norwegian specimens presented by him. As to the relative length of thorax and abdomen, Sars' figures agree well with my Norwegian specimens, but in these the uropods are more remote from the end of abdomen (fig. 1 k) than according to his figures, in which the uropods reach beyond the end of abdomen which is not the case in his co-types mentioned, while it exists in all the "Ingolf" specimens. Sars stated that he had taken *S. cylindrata* at several places "in depths ranging from 50 to 200 fathoms".

Judging from these statements one might be tempted to suppose that Sars had mixed up two different species. But though the "Ingolf" material is small, it originates from three localities with the depth from about 1200 to near 1700 fathoms, two specimens from the cold and two from the warm area, and these specimens show various differences. Furthermore, the antennulæ show features intermediate between Sars' figures of *S. cylindrata* and his two co-types mentioned; the thoracic legs are in two "Ingolf" specimens about as drawn by Sars, in two other specimens still shorter and thicker. For such reasons I am apt to think that all specimens seen by Sars or me are in reality variations of the same species. But it may be of some significance to add some further notes on the "Ingolf" specimens from each locality.

The female from Stat. 113 (fig. 1 a), which measures 3.7 mm in length, is more slender than any other of my specimens and than that figured by Sars, as it is even slightly more than nine times as long as broad. But its antennulæ (fig. 1 b) have the fourth joint shorter and thicker than in the specimens from the other stations, though less thick than in Sars' drawing (fig. 1 a[1]), while the chelæ are more robust and the thoracic legs (figs. 1 c and 1 d) shorter and thicker than in the specimen figured by Sars or in my specimens from other places. The chelæ (fig. 1 b) are slightly more than twice as long as broad; the abdomen is longer than in specimens from any other source, being as long as the five posterior thoracic segments plus more than half of second segment combined, while the sixth abdominal segment is only a little longer than the three preceding segments combined. In Sars' figures and in his two co-types the abdomen is scarcely as long as the five posterior thoracic segments combined, but its sixth segment is as long as the four preceding segments together. — The subadult male from the same place — Stat. 113 — agrees in all respects with the female and its antennulæ are but slightly thicker, but it has moderately developed pleopods, the rami of which are somewhat long in proportion to the peduncle and the setæ on their terminal margin short (as figured by Sars).

The subadult male from the "Ingolf" Stat. 24 (figs. 1 e and 1 f) agrees as to the relative length

of the thorax and abdominal segments, the length and thickness of the chelæ and the thoracic legs with Sars' figures. It may be mentioned that the chelæ in this "Ingolf" specimen (fig. 1 e), in Sars' figure and in my Norwegian specimens are conspicuously more slender than in the above-described specimens from Stat. 113, the chela being somewhat more than twice as long as broad. But in this "Ingolf" specimen from Stat. 24 the antennulæ are intermediate between those from Stat. 113 and my Norwegian specimens (fig. 1 g), especially their fourth joint is slightly shorter and distinctly thicker than in the last-named specimens. — The young male from the "Ingolf" Stat. 20 has the pleopods rudimentary; the sixth abdominal segment is as long as the five other abdominal segments combined, but as to the length and thickness of the thoracic legs, the length of abdomen in proportion to the thorax and the shape of the chelæ the specimen agrees with Sars' figures, while the antennulæ, and especially their short and thick fourth joint, are similar to those in the specimens from Stat. 113.

From this somewhat detailed investigation it may be seen that it is impossible to divide my somewhat scanty material from both the cold and the warm areas and from Norway into two or three species and besides to take the Norwegian specimens figured and described by Sars into account, because the characters are mingled apparently without reference to depth or temperature. Therefore I feel myself compelled to refer all specimens to the same species which shows considerable but gradual variation in several features.

Length of the largest specimen, the female from Stat. 113, 3.7 mm, of my largest specimen from Norway 3.0 mm.

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

Davis Strait: St. 24: Lat. 63° 06′ N., Long. 56° 00′ W., 1199 fm., temp. 2.4°; 1 subadult male.

South-East of Cape Farewell: St. 20: Lat. 58° 20′ N., Long. 40° 48′ W., 1695 fm., temp. 1.5°; 1 young male.

South of Jan Mayen: St. 113: Lat. 69° 31′ N., Long. 7° 06′ W., 1309 fm., temp. ÷ 1.0°; 1 female and 1 subadult male.

Distribution. *S. cylindrata* was hitherto known only from several places at the southern and western coasts of Norway, "in depths ranging from 50 to 200 fathoms. It extends northwards to Selsovig, situated just within the polar circle."

74. **Strongylura minima** n. sp.

(Pl. XI, figs. 5 a—5 d.)

Subadult Male. This tiny species is, seen from above (fig. 5 a), moderately slender, about seven and a half times as long as broad, subcylindrical, yet tapering slightly towards both ends. — Carapace not quite as long as the three following segments combined, narrower than the next segment, much longer than broad, anteriorly conspicuously more than half as broad as behind the middle.

Antennulæ moderately robust (fig. 5 b), slightly longer than the carapace. First joint two and a half times as long as deep, somewhat shorter than the three other joints combined; second joint somewhat produced above and half as long as the first; third joint middle-sized, distinctly longer than

deep; fourth joint somewhat shorter than the two preceding joints combined and much shorter than the longest terminal seta. — Antennæ of middle length; second and third joints uncommonly long; fourth and fifth joints completely fused, about twice as long as the sixth joint.

Chelipeds (fig. 5b) moderately strong. Basal joint somewhat more than half as long as the carpus, with the posterior protuberance deep but short, its hind margin free and rounded and reaching somewhat behind the front lower angle of second thoracic segment. Carpus somewhat long, slightly more than twice as long as deep, with the lower margin distinctly convex. Chela as long as the carpus, slightly more than twice as long as broad, with the hind margin somewhat concave; movable finger somewhat short, very much shorter than the anterior margin of the hand, moderately strong; fixed finger with a single long seta on the posterior margin at its base, and with a more proximal, triangular protuberance and a more distal triangular tooth on the incisive margin.

Thoracic segments, seen from above (fig. 5a), as to relative length and the shape of the lateral margins in the main similar to those in *S. cylindrata*. The lateral margins of the second segment are rather convex; the three anterior segments together a little shorter than fifth and sixth segments combined. — Thoracic legs of moderate length and thickness. The two anterior pairs (fig. 5b) have fourth and fifth joints subequal in length and proportionately short, together as long as the sixth joint, which is somewhat longer than seventh with claw, and on these legs the spines are very short or partly wanting. Three posterior pairs somewhat similar to those of thick-legged specimens of *S. cylindrata*.

Abdomen only as long as seventh, sixth, fifth and half of the fourth thoracic segments combined; sixth segment as long as the three preceding segments together, its posterior margin is somewhat convex with an obtuse median angle (fig. 5a). Pleopods proportionately long (fig. 5c); the exopod much longer than the peduncle and somewhat longer than the endopod; the terminal setæ longer than the rami. — Uropods not much more than half as long as sixth segment, moderately robust (fig. 5c); peduncle short and thick, much deeper than long; endopod with the proximal joint twice as long as the distal; exopod about half as long as and much thinner than the proximal joint of the endopod.

Length of the single specimen 1.05 mm.

Female (without marsupium). As the single specimen is so curved that I did not venture to make an attempt to straighten it, the description of the species has been based on the subadult male, and some remarks on the female may be added.

The specimen is rather similar to the male in most respects, but differs in some minor particulars. As far as can be judged the specimen is somewhat more slender in proportion to length than the subadult male.

The carapace is considerably shorter than the three following segments combined. — The antennulæ (fig. 5d) are somewhat longer than the carapace, slender; the first joint is three times as long as deep; fourth joint is distinctly shorter than the second. — Chelipeds with the carpus about half as long again as the basal joint and nearly twice as long as deep; chela somewhat more than twice as long as broad, with the movable finger proportionately a little longer than in the male; the

two protuberances on the incisive margin of the fixed finger are well developed, and when the fingers are closed a row of three oblong holes are seen between them.

Abdomen proportionately as long as in the male, but the sixth segment is longer, being even slightly longer than the sum of fifth, fourth, third and half of the second abdominal segment.

Length 1.25 mm.

Occurrence. This species has been taken by the "Ingolf" at two deep stations in the warm area.

Davis Strait: St. 24: Lat. 63°06′ N.. Long. 56°00′ W., 1199 fm., temp. 2.4°; 1 female.

South of Iceland: St. 64: Lat. 62°06′ N., Long. 19°00′ W., 1041 fm., temp. 3.1°; 1 subadult male.

Distribution. This tiny species is easily separated from *S. cylindrata*. It is the smallest species hitherto known from the North Atlantic and probably smaller than any species hitherto described.

Strongylurella n. gen.

Allied to *Strongylura*, but differing in the following characters.

The thoracic segments as to relative length as in *Leptognathia*, consequently differing from *Strongylura* in having the three anterior segments combined conspicuously longer than the fifth and sixth segments combined. The last abdominal segment shorter than in *Strongylura* and longer than in *Leptognathia*, being slightly longer than broad. The uropods have the endopod divided as in *Strongylura*, as its proximal joint is much longer than the distal, but the exopod is wanting.

Remarks. It was found necessary to establish this new genus on a single species which differs materially from *Leptognathia*, *Strongylura* and allied genera.

75. **Strongylurella indivisa** n. sp.

(Pl. XII, figs. 2a—2e.)

Female (without marsupium). Body very slender (fig. 2a), about eight and a half times as long as broad, broadest behind the middle of the carapace and thence tapering slightly to the base of the abdomen. — Carapace large (fig. 2a), even a little longer than the two following segments combined, considerably longer than broad, at the front end scarcely half as broad as behind the middle and with the lateral margins evenly and moderately convex.

Antennulæ (fig. 2b) somewhat shorter than the carapace, shaped nearly as in *Strongylura cylindrata*. First joint a little shorter than the three other joints combined, two and a half times as long as deep, but only a little deeper before the base than at the distal end. Second joint considerably produced above, a little less than half as long as the first and distally thicker than at the base; third joint moderately large and distinctly longer than deep; fourth joint conspicuously longer than the third and shorter than the second. — Antennæ moderately short; fourth and fifth joints completely fused, about two and a half times longer than the sixth joint.

Chelipeds moderately robust (fig. 2b). The basal joint is somewhat shorter than the carpus.

its posterior protuberance somewhat long, longer than deep, with the rounded hind margin situated considerably before the front lower angle of second thoracic segment. Carpus a little more than half as long again as deep, with the upper margin very convex, the free part of the lower margin feebly convex. Chela considerably longer than the carpus, a little more than twice as long as broad, with two strong setæ on the posterior margin, which is distinctly convex between the distal of these setæ and the base; movable finger considerably shorter than the anterior margin of the hand, somewhat robust; when the fingers are adduced a triangular, oblong hole is seen between their proximal parts, while the subdistal part of the incisive margin of the fixed finger is rather convex.

Thoracic segments (fig. 2a) taper slightly in breadth from second to seventh segment; their lateral margins are feebly convex or nearly straight and a little curved at both ends. Second segment a little shorter than the third which is somewhat shorter than the fifth. — Thoracic legs somewhat short. The two anterior pairs (fig. 2b) are moderately strong, with sixth joint long, somewhat shorter than fourth and fifth joints combined and considerably longer than seventh with claw; most of their spines short. The three posterior pairs rather slender (fig. 2c); their sixth joint about as long as the fifth but much shorter than seventh joint with claw; seventh joint and claw subequal in length.

Abdomen as long as seventh, sixth, fifth and half of the fourth thoracic segment combined (fig. 2a). Five anterior segments with the ventral line straight (fig. 2d). Pleopods wanting. Sixth segment distinctly shorter than the three preceding segments combined (figs. 2d and 2e); its lateral margins somewhat long and straight, while each half of the posterior margin is considerably concave, as the median half of the segment is produced posteriorly into a triangle about twice as broad as long and with the end acute (fig. 2d). — Uropods as long as the straight lateral margin of the last abdominal segment, moderately strong; peduncle, seen from the side (fig. 2e), oblong rectangular; endopod twice as long as the peduncle, with its proximal joint slightly less than twice as long as the distal joint; exopod completely wanting.

Length of the single specimen 1.7 mm.

Remarks. *S. indivisa* is easily distinguished from all other species mentioned in this paper by having a well developed and two-jointed endopod but no exopod on the uropods; furthermore the shape of the last abdominal segment is very characteristic.

Occurrence. Taken by the "Ingolf" at the following station.

South-West of Iceland: St. 78: Lat. 60° 37′ N., Long. 27° 52′ W., 799 fm., temp. 4.5°; 1 spec.

Paranarthrura n. gen.

Description. As to general aspect somewhat similar to *Leptognathia*. The body tapers considerably from the posterior part of the carapace or the front part of second segment to the abdomen. — Antennulæ four-jointed and shaped as in *Leptognathia*. Antennæ with fourth and fifth joints completely fused. — Mouth-parts (examined only in *P. insignis*) somewhat aberrant; the labrum (Pl. XII, fig. 3c) is produced in a somewhat long, distally obtuse triangle; the mandibles (figs. 3c and 3d) are somewhat long, without molar process, curved inwards far beyond the middle, and the

incisive margin of the right mandible has few and obtuse teeth, while that of the left mandible is somewhat incised and the movable lobe moderately developed. The maxillulæ are very slender (fig. 3e); the maxillipeds (fig. 3f) have their proximal unpaired part long, the lobes are well separated to their base and each has two short setæ at the terminal margin.

The thoracic segments have the lateral margins conspicuously angular and the anterior segments as to length developed as in *Leptognathia*. The thoracic legs shaped as in the last-named genus.

Abdomen in the female very short (figs. 3a and 4a); its five anterior segments combined at most as long as seventh thoracic segment, considerably narrower than this segment and somewhat narrower than sixth abdominal segment, which is broader than long and posteriorly somewhat produced. Pleopods wanting. Uropods short, with the exopod either unjointed or not marked off, the endopod one-jointed or two-jointed. — In the subadult male the five anterior abdominal segments are somewhat longer than in the female and their pleopods are moderately long, but terminal setæ are either somewhat short (fig. 3m) or quite wanting (fig. 5c). — (Adult males unknown).

Remarks. This genus differs from all preceding genera with four-jointed antennulæ in having the five anterior abdominal segments much reduced both in length and breadth; in the female of the genus *Anarthrura* G. O. S. the abdomen is also much reduced in length, but all segments are fused so that not even a vestige of a division into segments is visible. Furthermore, in *Anarthrura* the coxal joint of the chelipeds is, according to Sars' figure, developed as a free, outstanding joint different from the structure found in any species of *Paranarthrura*. Finally, the abdomen in the subadult male of *Anarthrura* is according to Sars much more developed than in *Paranarthrura* (I consider the male of *Anarthrura* figured by Sars to be not adult but in all probability only subadult, because its antennulæ contain only five joints as in subadult males of several species of *Leptognathia*, and because the thoracic segments and their legs do not differ materially from those in the female.)

Three new species secured by the "Ingolf" in the warm area are referred to this new genus. These species differ materially from each other in several particulars.

76. **Paranarthrura insignis** n. sp.

(Pl. XII, figs. 3a—3m.)

Female. Moderately slender (fig. 3a), almost seven times as long as the breadth of the carapace somewhat before its hind margin and tapering considerably backwards. — Carapace large, as long as the two following segments combined (fig. 3a), somewhat longer than broad, somewhat behind the middle more than two and a half times as broad as at the insertion of the antennulæ and thus nearly pear-shaped.

Antennulæ a little or somewhat shorter than the carapace, rather slender (fig. 3b). First joint uncommonly long, somewhat longer than the three other joints combined, nearly three and a half times as long as deep, but considerably deeper somewhat from the base than somewhat beyond the middle. Second joint distinctly produced above, as deep as the distal part of the first joint but slightly more than one-third as long as that joint; third joint distinctly longer than deep; fourth joint somewhat shorter than the second. — Antennæ slender and moderately short.

Chelipeds moderately strong (fig. 3b). Basal joint short, somewhat deeper than long, without any posterior protuberance, as its whole posterior margin is oblique and inserted on a very large, well defined coxal area; the hind margin of the joint is very remote from the front lower end of second thoracic segment. Carpus twice or more than twice as long as deep, peculiarly shaped; the lower margin has a very low protuberance with two small setæ at the middle and behind and beyond this protuberance the margin is feebly concave; the upper proximal part of the joint is somewhat produced backwards. Chela somewhat longer than the carpus and a little more than twice as long as broad; the movable finger somewhat robust, as long as or slightly longer than the anterior margin of the hand, which is conspicuously but more or less irregularly arcuate; the posterior margin of the chela is sinuate, showing three concave or flatly incised places (figs. 3b and 3l — the last figure drawn from a subadult male); the incisive margin of the fixed finger has a sharp tooth somewhat from the end.

Thoracic segments, seen from above (fig. 3a), peculiarly shaped and increasing somewhat in length from the second to the sixth. Second segment, which is slightly narrower than the carapace, is considerably broader anteriorly than behind, with the lateral margins converging considerably backwards. Third to seventh segment on each lateral margin with a rounded protuberance, which on the third segment is situated somewhat before the middle, on the following segments gradually more backwards; the front half of each lateral margin of the three posterior segments is conspicuously convex. In specimens without marsupium (fig. 3b) each segment has on the ventral side a moderately long, slender, acute process; on second segment this process is situated near the front end, on the following segments gradually more backwards, on seventh segment (fig. 3h) somewhat or a little before the middle; the anterior processes (fig. 3b) are curved much forwards, while on the posterior segments they are directed more downwards (fig. 3h); in females with marsupium the processes of second to sixth segments are lost, but the process on seventh segment is preserved. — Thoracic legs (figs. 3b and 3g) rather slender, decreasing in length from second pair, which are somewhat long, to seventh pair, which are somewhat short; most of the spines on the legs are somewhat long. Second pair with fourth and fifth joints rather long, sixth joint somewhat longer than the fifth and about as long as seventh joint with claw; the spine on the anterior angle of fifth joint long. Seventh pair (fig. 3g) with sixth joint a little or slightly shorter than fifth joint and somewhat shorter than seventh joint together with the fine, curved claw.

Abdomen very short. Five anterior segments, when straightened (fig. 3i), together a little or somewhat shorter and much narrower than seventh thoracic segment. Sixth segment, seen from above (fig. 3i), a little longer than the three preceding segments combined, much broader than long and somewhat broader than the fifth segment, posteriorly at the middle distinctly triangularly produced; the lateral margins very convex. — Uropods about as long as, or a little longer than, sixth segment, robust; exopod not marked off and directed essentially downwards (fig. 3h), being an oblong, triangular protuberance from the distal angle of the peduncle and longer than the peduncle itself, which is at least as long as deep; endopod two-jointed, with the first joint distinctly shorter than the second.

Length of a large female without marsupium 2.9 mm, of females with marsupium 2.6—2.8 mm.

Subadult Male. It differs from full-grown females without marsupium in three features

The antennulæ (fig. 3k) are considerably thicker; the first joint somewhat or rather considerably shorter than the three other joints combined and only a little more than two and a half times as long as deep; second joint considerably produced above; fourth joint nearly as long as the second and thickened, especially at the base. The five anterior abdominal segments (fig. 3m) are much longer than in the female, together about twice as long as seventh thoracic segment. The pleopods are somewhat large, with the rami much longer than the peduncle, but the terminal setæ are slightly more than half as long as the rami and somewhat thick.

Smaller than the females, measuring only 2.2—2.3 mm.

Remarks. *P. insignis* is a fine form which is abundantly distinguished from the two following species by possessing ventral thoracic processes, by the shape of the thoracic segments, the chelipeds and above all by the uropods.

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

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 1 spec.

— — St. 25: Lat. 63° 30′ N., Long. 54° 25′ W., 582 fm., temp. 3.3°; more than a hundred specimens.

— — St. 24: Lat. 63° 06′ N., Long. 56° 00′ W., 1199 fm., temp. 2.4°; 6 spec.

77. **Paranarthrura subtilis** n. sp.

(Pl. XII, figs. 4a—4d.)

Female (without marsupium). Rather slender (fig. 4a), about seven and a half times as long as broad a little behind the front end of second thoracic segment and tapering considerably backwards. — Carapace as long as the second and half of the third segment combined — these segments are long —, somewhat longer than broad, not fully twice as broad at the middle as at the front end and with the lateral margins moderately convex.

Antennulæ much shorter than the carapace (fig. 4b), somewhat thick. First joint subcylindrical and somewhat more than twice as long as deep; second joint scarcely produced above and half as long as the first; third joint a little longer than deep; fourth joint scarcely as long as the second. — Antennæ short, a little more than half as long as the antennulæ.

Chelipeds (fig. 4b) somewhat slender. Basal joint short, about as long as deep, without posterior protuberance, but attached by the whole oblique hind margin, which is situated a little behind the middle of the cephalothorax. Carpus two and a half times as long as deep, with the upper proximal part produced backwards, the major part of the upper margin nearly straight and the lower margin a little sinuate. Chela scarcely as long as the carpus, somewhat slender, being two and a half times as long as broad; the movable finger as long as the front margin of the hand, moderately robust; the posterior margin is a little concave at the middle, where a single seta is inserted; the end of both fingers very acute.

Thoracic segments (fig. 4a) with the lateral margins very conspicuously angular; the angles, which on second segment are near the front end, are on the following segments placed gradually more backwards, on seventh segment somewhat from the posterior end; the margins between the acute

or somewhat rounded angles and both ends of each segment are straight. Third, fourth, fifth and sixth segments subequal in length, while second and seventh segments are somewhat shorter. No ventral processes are found. — Thoracic legs (figs. 4b and 4c) moderately short, and all subequal in length and moderately slender; the relative length of the joint almost as in *P. insignis*, but the spines on the anterior pairs are much shorter than in that species.

Abdomen very short (fig. 4a). Five anterior segments combined scarcely as long as and considerably narrower than seventh thoracic segment (fig. 4d). Sixth segment about as long as the four preceding segments combined and somewhat broader than the fifth segment; each half of its posterior margin is considerably concave, as the median third of the segment is produced backwards in a triangle with the end nearly acute. — Uropods robust and somewhat shorter than the sixth segment; the peduncle longer than deep (fig. 4c), with the outer distal angle a little produced as a small rudiment of an exopod not marked off; the endopod unjointed, slightly longer than the peduncle.

Length of the largest specimen 1.9^{mm}.

Remarks. *P. subtilis* is easily distinguished from all other Tanaidæ with four-jointed antennulæ described in this paper by its uropods. The antennulæ are unusually thick and shaped as in subadult males of allied forms, but as no pleopods are found the specimens must be females.

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

Davis Strait: St. 32: Lat. 66° 35′ N., Long. 56° 38′ W., 318 fm., temp. 3.9°; 7 spec.

78. **Paranarthrura clavipes** n. sp.

(Pl. XII, figs. 5a—5c.)

Immature Male and juvenile Specimen. Body, seen from above (fig. 5a), moderately slender, broadest across the carapace and tapering much backwards to the abdomen. — Carapace large (fig. 5a), somewhat shorter than the two following segments combined — which are uncommonly long —, somewhat longer than broad and broadest a little before the middle, which is nearly more than twice as broad as the front end, and consequently the lateral margins are very convex.

Antennulæ (fig. 5b) much shorter than the carapace. First joint a little longer than the three other joints combined and in the immature male two and a half times as long as deep; second joint somewhat produced above and not half as long as the first joint; third joint quite short; fourth joint considerably shorter than the second. — Antennæ of moderate length; the joint composed by the fusion of fourth and fifth joints is very long, while the penultimate joint is unusually short.

Chelipeds (fig. 5b) moderately strong. The basal joint is considerably longer than deep, posteriorly produced in a protuberance which is narrowly rounded behind, and the distance between its end and the front lower angle of second thoracic segment is a little more than half as long as the joint itself. Carpus slightly more than half as long again as the basal joint, somewhat more than twice as long as deep, with the upper basal part somewhat produced backwards; most of the upper margin and nearly the whole free lower margin are straight and slightly converging. Chela slightly longer than the carpus, almost two and a half times as long as broad, regularly shaped with the fingers acute; the posterior margin almost straight with a single seta; the movable finger slightly shorter than the anterior margin of the hand.

Thoracic segments, seen from above (fig. 5a), in the main as in *P. subtilis*, but more tapering than in this species; the lateral margins are sharply angular; second segment is unusually long, only a little shorter than the third, which is as long as the fourth or the fifth. — Second and third pairs of thoracic legs (fig. 5b) somewhat long and slender, with the spines thin and moderately or very short; fifth joint conspicuously longer than the fourth; sixth joint only a little shorter than fourth and fifth joints combined and considerably longer than the seventh joint with claw. Three posterior pairs (fig. 5c) only a little shorter than second pair; second joint is clavate, being very thin towards the base while the distal part is thick; sixth joint is somewhat longer and considerably thinner than the robust fifth joint and somewhat longer than the seventh joint with claw.

Abdomen in general shape somewhat similar to that of *P. subtilis*. As the seventh thoracic segment is only half developed — having no legs — in the juvenile specimen shown in fig. 5a, the length of the abdomen must in this figure be compared not with seventh but with sixth thoracic segment. In the immature male (fig. 5c) the five anterior segments combined are nearly half as long again as seventh thoracic segment; the pleopods are of moderate size, with the exopod longer than the peduncle, but both rami completely without setæ. In the immature male the sixth abdominal segment is not quite as long as the three preceding segments combined; in the juvenile specimen it is even longer than the four preceding segments combined; it is a little less broad in proportion to length than in *P. subtilis*, and the produced part between the uropods is not triangular but rounded. — Uropods considerably shorter than the sixth segment; the peduncle is much shorter than deep (fig. 5c); the endopod two-jointed, with the second joint much longer than the first; the exopod is well marked off, one-jointed, a little more than half as long as, and much thinner than, the endopod.

Length of the immature male 2.15 mm, of the juvenile specimen 1.7 mm.

Remarks. In the structure of the uropods and the posterior protuberance on the basal joint of the chelipeds *P. clavipes* is sharply distinguished from the two preceding species. The clavate shape of the second joint of the three posterior pairs of thoracic legs is also very characteristic.

Occurrence. Taken by the "Ingolf" at the deepest of its stations.

South of the Davis Strait: St. 38: Lat. 59° 12′ N., Long. 51° 05′ W., 1870 fm., temp. 1.3°; 2 spec. (1 immature male and 1 juvenile specimen).

EXPLANATION OF THE PLATES.

Plate I.

Fig. 1. *Apseudes vicinus* n. sp.

Fig. 1 a. Body of the single specimen, an immature female, from above; × 21.
— 1 b. Left cheliped, from the outer side; × 32.
— 1 c. Left second thoracic leg, from the outer side; × 32.

Fig. 2. *Apseudes tenuis* n. sp.

Fig. 2 a. Cephalothorax and four thoracic segments of a subadult female from the "Ingolf" Stat. 24, from above; × 13.
— 2 b. Seventh thoracic segment and abdomen of the same specimen, from above; × 13.
— 2 c. Left cheliped of a subadult female, from the outer side; × 24.
— 2 d. Left second thoracic leg of the same specimen, from the outer side; × 24.
— 2 e. Left seventh thoracic leg of the same specimen, from the outer side; × 24.

Fig. 3. *Apseudes gracilis* Norm. & Stebb.

Fig. 3 a. Cephalothorax and three thoracic segments of a subadult female, from above; × 10.
— 3 b. Left cheliped of the same specimen, from the outer side; × 22.
— 3 c. Distal half of the fixed finger of the chela of the cheliped shown in fig. 3 b, from the outer side; × 90.
— 3 d. Left second thoracic leg of the same specimen, from the outer side; × 22.

Fig. 4. *Apseudes gracillimus* n. sp.

Fig. 4 a. Cephalothorax and the major part of the thorax of a subadult female, from above; × 10.
— 4 b. Seventh thoracic segment and abdomen of the same specimen, from above; × 10.
— 4 c. Left cheliped of a subadult female, from the outer side; × 23.
— 4 d. Left second thoracic leg of the same specimen, from the outer side; × 23.
— 4 e. Left seventh thoracic leg of the same specimen, from the outer side; × 23.

Fig. 5. *Heterotanais groenlandicus* n. sp.

Fig. 5 a. Female with marsupium, from above; × 16.
— 5 b. Carapace with antennulæ of the same specimen, from above; × 35.
— 5 c. Carapace and second thoracic segment with appendages of a female with marsupium, from the left side; × 47.
— 5 d. The fixed finger of the left chela of the same female, from the outer side; × 94.
— 5 e. Left third thoracic leg of the last-named female, from the outer side; × 47.
— 5 f. Left seventh thoracic leg of the last-named female, from the outer side; × 47.
— 5 g. End of abdomen with the left uropod of the same female, from the left side; × 47.

Fig. 6. *Neotanais serratispinosus* Norm. & Stebb.

Fig. 6a. Left cheliped of an adult female, from the outer side; × 23.

— 6b. Fingers of the cheliped shown in fig. 6a, from the outer side; × 67.

Plate II.

Fig. 1. *Neotanais serratispinosus* Norm. & Stebb. (Continued).

Fig. 1a. Terminal part of left third thoracic leg of an adult female, from the posterior side; × 74.

— 1b. Terminal part of left sixth thoracic leg of the same female, from the posterior side; × 74.

— 1c. Terminal part of left seventh thoracic leg of the same female, from above; × 74.

Fig. 2. *Neotanais giganteus* n. sp.

Fig. 2a. Adult male, from above; × 3.

— 2b. Anterior part of the carapace with the right antennula of the male, from above; × 8.

— 2c. Front end of the carapace with the ocular plate, the left antenna and the basal part of the left antennula, of the male, from the left side; × 8.

— 2d. Left cheliped of the male, from the outer side; × 8.

— 2e. Right second thoracic leg, from the posterior side; × $^{33}/_{4}$.

— 2f. Terminal part of the leg shown in fig. 2e, from behind; × 24.

— 2g. Terminal part of right seventh leg, obliquely from above and in front; × 24.

— 2h. Last abdominal segment with the left uropod and the proximal part of the right uropod of the male, from above; scarcely × 7.

Fig. 3. *Pseudotanais forcipatus* Lilljeborg.

Fig. 3a. Body of an adult male, from above; × 36.

— 3b. Cephalothorax and the two anterior free thoracic segments with appendages of the adult male, from the left side; × 81.

— 3c. Front end of the carapace with the antennulæ of the adult male, from above; × 81.

— 3d. Left seventh thoracic leg of the adult male, from the outer side; × 81.

— 3e. Three posterior abdominal segments with the uropods of an adult male, from above; × 81.

4. *Pseudotanais abyssi* n. sp.

Fig. 4a. Female with the marsupium not half developed, from the left side; × 49.

— 4b. Body of a female with the marsupium fully developed, from above; × 36.

— 4c. Front end of the carapace with left antennula and antenna of the adult female, from the left side; × 98.

— 4d. Left cheliped of an immature female, from the outer side; × 98.

— 4e. Right second thoracic leg of an adult female, from the outer side; × 91. The articulation between fourth and fifth joint erroneously omitted.

— 4f. Left third thoracic leg of an immature female, from the outer side; × 98.

— 4g. Right fifth thoracic leg of an immature female, from the outer side; × 98.

Fig. 4h. Left first pleopod of an adult female, from behind; × 94.
— 4i. Right uropod of an adult female, from above; × 145.

Fig. 5. *Pseudotanais Lilljeborgii* G. O. Sars.

Fig. 5a. Carapace with right antennula and half of left antennula of an ovigerous female, from above; × 45.
— 5b. Carapace with left antennula and half of the right antennula of an adult male, from above; × 45.
— 5c. Cephalothorax and the two anterior free thoracic segments with appendages of the adult male, from the left side; × 61.
— 5d. Four posterior abdominal segments and uropods of the adult male, from above; × 57.
— 5e. Left seventh thoracic leg of the adult male, from the outer side; × 61.
— 5f. Distal part of the leg shown in fig. 5e, from the outer side, × 146.
— 5g. Distal part of seventh thoracic leg of a subadult male, from the outer side; × 146.

Fig. 6. *Pseudotanais oculatus* n. sp.

Fig. 6a. Distal part of left cheliped of a not fully adult female, from the outer side; × 78.
— 6b. Left second and third thoracic legs of a not fully adult female, from the outer side; × 78.
— 6c. Left fourth thoracic leg of the same female, from the outer side; × 78.
— 6d. Left seventh thoracic leg of the same female, from the outer side; × 78.

Plate III.

Fig. 1. *Pseudotanais oculatus* n. sp. (Continued).

Fig. 1a. Body of a female with the marsupial lamella small, from above; × 24.
— 1b. Female with the marsupial lamella small, from the left; × 25.
— 1c. Front end of carapace with ocelli and left antennula and antenna of the female shown in fig. 1b, from the left side; × 78.
— 1d. Right uropod of the female shown in fig. 1a, from above; × 85.

Fig. 2. *Pseudotanais affinis* H. J. Hansen.

Fig. 2a. Carapace with left antennula of a female with marsupium from the Kara Sea, from above; × 33.
— 2b. Left antennula of the adult female from the Kara Sea, from the outer side: × 70.
— 2c. Right uropod of the adult female from the Kara Sea, from above; × 83.
— 2d. Left antennula and antenna of a female without marsupium from the "Ingolf" Stat. 103; from the outer side; × 56.
— 2e. Left chela of the same female from the "Ingolf" Stat. 103, from the outer side; × 56.
— 2f. Left second thoracic leg of the same female from the "Ingolf" St. 103, from the outer side; × 56.
— 2g. Left third thoracic leg of the same "Ingolf" specimen, from the outer side; × 56.
— 2h. Left seventh thoracic leg of the same "Ingolf" specimen, from the outer side; × 56.

Fig. 2i. Distal part of left third leg shown in fig. 2g, from the outer side; × 130.
— 2k. Left antennula and antenna of a female without marsupium belonging to the variety from the "Ingolf" Stat. 25, from the outer side; × 82.
— 2l. Left antennula and antenna of a subadult male from the "Ingolf" Stat. 119, from the outer side; × 52.
— 2m. Left chela of an immature male from the "Ingolf" Stat. 119, from the outer side; × 52.
— 2n Left antennula and antenna of a subadult male of the variety from the "Ingolf" Stat. 25, from the outer side; × 82.
— 2o. Left sixth thoracic leg of a subadult male from the "Ingolf" Stat. 119, from the inner side; × 52.

Fig. 3. ? *Pseudotanais affinis* H. J. H.; adult Male.

Fig. 3a. Cephalothorax and second thoracic segment with appendages of the male from the "Ingolf" Stat. 124, from the left side; × 80.
— 3b. Four posterior abdominal segments and uropods of the same male, from above; × 80.

Fig. 4. *Pseudotanais longipes* n. sp.

Fig. 4a. Female with the marsupial lamellæ quite small, from the left; × 35.
— 4b. Anterior part of the body of the not quite full-grown female, from above; × 35.
— 4c. Left antennula and antenna of the female shown in fig. 4a, from the outer side; × 55.
— 4d. Left chela of the same immature female, from the outer side; × 63.
— 4e. Left second thoracic leg of the same immature female, from the outer side; × 63.
— 4f. Left third thoracic leg of the same immature female, from the outer side; × 63.
— 4g. Distal part of the left fourth thoracic leg of the same female, from the outer side; × 100.
— 4h. Left seventh thoracic leg of the same immature female, from the outer side; × 61.
— 4i. Right uropod of an immature female, from above; × 84.

Fig. 5. *Typhlotanais irregularis* n. sp.

Fig. 5a. Female, from above; × 31.
— 5b. Cephalothorax and the two anterior free thoracic segments of a female without marsupium from the "Ingolf" Stat. 117, from the left side; × 73.
— 5c. Left chela of the specimen shown in fig. 5b, from the outer side; × 128.
— 5d. Left seventh thoracic leg of the same female, from the inner side; × 73.
— 5e. Last abdominal segment with left uropod of the same female, from the left; × 73.

Fig. 6. *Typhlotanais macrocephala* n. sp.

Fig. 6a. The type-specimen, from above; × 43.
— 6b. Cephalothorax and the two anterior free thoracic segments of the single specimen, from the left; × 85.
— 6c. Second and third thoracic segments, from above; × 84.
— 6d. Left seventh thoracic leg, from the outer side; × 85.
— 6e. Last abdominal segment with left uropod, from the left; × 110.

Plate IV.

Fig. 1. *Typhlotanais pulcher* n. sp.

Fig. 1 a. The single specimen (without marsupium), from above; × 21.
— 1 b. Cephalothorax with antennulæ, from above; × 45.
— 1 c. Cephalothorax and second thoracic segment with appendages, from the left side; × 60.
— 1 d. Left third thoracic leg, from the outer side; × 60.
— 1 e. Left fifth thoracic leg, from the outer side; × 60.
— 1 f. Left seventh thoracic leg, from the outer side; × 60.
— 1 g. Left uropod, from above; × 88.

Fig. 2. *Typhlotanais gracilipes* n. sp.

Fig. 2 a. Anterior part of the body with antennulæ of the female without marsupium; × 44.
— 2 b. Carapace and anterior thoracic segments with appendages, from the left side; × 63.
— 2 c. Left fourth thoracic leg, from the outer side; × 63.
— 2 d. Right sixth thoracic leg, from the inner side; × 122.
— 2 e. End of abdomen with the mutilated left uropod — the endopod wanting — from above; × 132.

Fig. 3. *Typhlotanais mucronatus* n. sp.

Fig. 3 a. Body of a female without marsupium (from the "Ingolf" Stat. 120), from above; × 20.
— 3 b. Carapace with antennulæ of the specimen shown in fig. 3 a, from above; × 37.
— 3 c. Cephalothorax and two anterior free thoracic segments with appendages of a female without marsupium from the "Ingolf" Stat. 119, from the left side; × 48.
— 3 d. Left chela of the female shown in fig. 3 c, from the outer side; × 96.
— 3 e. Left sixth thoracic leg of the last-named female, from the outer side; × 48.
— 3 f. Distal half of the leg shown in fig. 3 e, from the outer side; × 90.
— 3 g. Last abdominal segment with left uropod of the last-named female, from the left side; × 57.
— 3 h. Left antennula and antenna of a subadult male from the "Ingolf" Stat. 120, from the left side; × 48.

Fig. 4. *Typhlotanais eximius* n. sp.

Fig. 4 a. Immature, somewhat contracted female, from above; × 35.
— 4 b. Cephalothorax and the two anterior free segments with appendages of the largest female without marsupium, from the left side; × 80.
— 4 c. Seventh right thoracic leg of the last-named female, from the outer side; × 80.
— 4 d. Right uropod of the specimen shown in fig. 4 a, from above; × 88.
— 4 e. Cephalothorax and two anterior free segments with appendages of the immature male, from the left side; × 77.
— 4 f. Left sixth thoracic leg of the immature male, from the outer side; × 77.
— 4 g. Last abdominal segment with left uropod of the immature male; × 77.

Fig. 5. *Typhlotanais penicillatus* G. O. Sars.

Fig. 5a. Cephalothorax and anterior free segments with appendages of a female without marsupium, from the left side; × 80.

— 5b. Left sixth thoracic leg of the same female, from the outer side; × 80.

— 5c. Last abdominal segment with left uropod of the same female, from the left side; × 80.

— 5d. Left antennula of an immature male, from the outer side; × 80.

Fig. 6. *Typhlotanais inermis* n. sp.

Fig. 6a. Body of a female without marsupium, from above; × 22.

— 6b. Carapace with antennulæ of the same female, from above; × 42.

— 6c. Cephalothorax and anterior thoracic segments with appendages of a female without marsupium from the "Ingolf" Stat. 139, from the left side; × 55.

— 6d. Left chela of the specimen shown in fig. 6c, from the outer side; × 100.

— 6e. Left sixth thoracic leg of the female shown in fig. 6c, from the outer side; × 55.

— 6f. Distal half of the leg shown in fig. 6e, from the outer side; × 138.

— 6g. Right uropod of the specimen shown in fig. 6a, from above; × 76.

Fig. 7. *Typhlotanais variabilis* n. sp.

Fig. 7a. Female without marsupium from the "Ingolf" Stat. 102, from above; × 22. The legs omitted.

— 7b. Left sixth thoracic leg of the adult female shown in fig. 2a on the next plate, from the outer side; × 50.

— 7c. Major distal part of left seventh leg of the last-named female, from the outer side; × 110.

— 7d. Left uropod of the last-named adult female, from the outer side; × 50.

Plate V.

Fig. 1. *Typhlotanais mucronatus* n. sp.

Fig. 1a. Left antennula and antenna of a subadult male, from the outer side; × 48. (This figure, which is found as fig. 3h on Pl. IV, has by an error in the arrangement been reproduced here again.)

Fig. 2. *Typhlotanais variabilis* n. sp. (Continued.)

— 2a. Cephalothorax and anterior thoracic segments of an adult female from the "Ingolf" Stat. 102, from the left side; × 50. *p.* parasitic Copepod, measuring 0.1 mm in length.

— 2b. Left antennula and antenna of a female without marsupium from the "Ingolf" Stat. 105, from the outer side; × 50.

— 2c. Cephalothorax and anterior thoracic segments with appendages of a subadult male from the "Ingolf" Stat. 105, from the left side; × 55.

Fig. 3. *Typhlotanais tenuicornis* G. O. Sars.

Fig. 3a. Left antenna, setæ omitted, of a female from Norway (a co-type of G. O. Sars), from the outer side; × 140.

— 3b. Major distal part of left second thoracic leg of a female from Norway, from the outer side; × 140.

— 3c. Left third leg of the last-named female, from the outer side; × 140.

Fig. 4. *Typhlotanais trispinosus* n. sp.

Fig. 4a. Female without marsupium, from above; × 21. The legs omitted.
— 4b. Cephalothorax and anterior thoracic segments with appendages of a female without marsupium, from the left side; × 82.
— 4c. Left antenna of the last-named female, from the outer side; × 140. The setæ omitted.
— 4d. Major distal part of left second thoracic leg of the specimen shown in fig. 4b, from the outer side; × 140.
— 4e. Right seventh thoracic leg of a female without marsupium, from the outer side; × 205.
— 4f. Left uropod of the female shown in fig. 4b, from the outer side; × 82.

Fig. 5. *Typhlotanais profundus* n. sp.

Fig. 5a. Female without marsupium, from above; × 21. The legs omitted.
— 5b. Left antennula of the same specimen, from above; × 75.
— 5c. Left antennula and antenna of a female without marsupium, from the outer side; × 78.
— 5d. Left uropod of a female without marsupium, from the outer side; × 80.
— 5e. Cephalothorax and anterior thoracic segments with appendages of a subadult male, from the outer side; × 78.

Fig. 6. *Typhlotanais spinicauda* n. sp.

Fig. 6a. Cephalothorax and three anterior thoracic segments of the single specimen, a female without marsupium, from above; × 30.
— 6b. Cephalothorax and anterior thoracic segments with appendages of the female without marsupium, from the left side; × 45.
— 6c. Left antennula and antenna, from the outer side; × 83.
— 6d. Distal half of left cheliped, from the outer side; × 83.
— 6e. Left second thoracic leg, from the outer side; × 83.
— 6f. Left third thoracic leg, from the outer side; × 83.
— 6g. Right sixth thoracic leg, from the outer side; × 83.
— 6h. Last abdominal segment with the uropods, from above; × 60.

Fig. 7. *Typhlotanais grandis* n. sp.

Fig. 7a. Body of the single specimen, probably an immature male, from above; × 13.
— 7b. Cephalothorax and anterior thoracic segments with appendages of the specimen mentioned, from the side and somewhat obliquely from above; × 38.
— 7c. Left seventh thoracic leg, from the outer side; × 38.
— 7d. Major distal part of the leg shown in fig. 7c, from the outer side; × 135.
— 7e. Last abdominal segment with left uropod, from the outer side; × 54.

Fig. 8. *Typhlotanais plebejus* n. sp.

Fig. 8a. Body of a female without marsupium, from above; × 16.
— 8b. Left antennula and antenna of a female without marsupium, from the outer side; × 58.
— 8c. Left cheliped of a female without marsupium, from the outer side; × 58.

Fig. 8d. Left second thoracic leg of a female without marsupium, from the outer side; × 58.
— 8e. Left fourth thoracic leg of the same female, from the outer side; × 58.
— 8f. Left fifth thoracic leg of the same female, from the outer side; × 58.
— 8g. Last abdominal segment with left uropod of a female without marsupium, from the left side; × 58.

Fig. 9. *Typhlotanais inæquipes* n. sp.

Fig. 9a. Right seventh thoracic leg of a female without marsupium, from the outer side; × 80.
— 9b. Left uropod of a female without marsupium, from the outer side; × 80.

Plate VI.

Fig. 1. *Typhlotanais inæquipes* (Continued.)

Fig. 1a. Body of a female without marsupium, from above; × 25.
— 1b. Right antennula of the same female, from above; × 80.
— 1c. Cephalothorax and anterior thoracic segments with appendages of a female without marsupium, from the left side; × 80.

Fig. 2. *Typhlotanais finmarchicus* G. O. Sars.

Fig. 2a. Left antennula and antenna of a female without marsupium from the Sabine Island, from the left side; × 84.
— 2b. Left uropod of the same female, from the outer side; × 84.

Fig. 3. *Typhlotanais mixtus* n. sp.

Fig. 3a. Body of a female without marsupium from the "Ingolf" Stat. 117, from above; × 27.
— 3b. Cephalothorax and anterior thoracic segments of a female with marsupium (the marsupium itself omitted) from the "Ingolf" Stat. 117, from the left side; × 82.
— 3c. Left antennula of a subadult male from the "Ingolf" Stat. 117, from the left side; × 82.
— 3d. Second thoracic segment (left leg omitted) of a female without marsupium from the same station, from the left side; × 82.
— 3e. Left sixth thoracic leg of the female shown in fig. 3b, from the outer side; × 82.

Fig. 4. *Typhlotanais solidus* n. sp.

Fig. 4a. The single specimen, a female without marsupium, from above; × 21. Most of the appendages omitted.
— 4b. Carapace with antennulæ, from above; × 32.
— 4c. Cephalothorax with appendages, from the left side; × 52.
— 4d. Left second and third thoracic legs, from the outer side; × 52.
— 4e. Right seventh thoracic legs, from the outer side; × 52.
— 4f. Last abdominal segment with right uropod, from above; × 52.

Fig. 5. *Agathotanais Ingolfi* n. gen., n. sp.

Fig. 5a. Largest female without marsupium, from above; × 15.

— 5b. Largest female without marsupium, from the left side; × 16.

— 5c. Front end of the cephalothorax with left antennula and antenna of the last-named female, from the left side; × 53.

— 5d. Both mandibles of a female without marsupium, from below; × 93. *l.* left mandible.

— 5e. Paragnatha of the last-named female, from below; × 93.

— 5f. Left maxillula of the last-named female, from below; × 93.

— 5g. Maxillipeds, with the epipods omitted, of the last-named female, from below; × 93.

— 5h. Left chela of the female shown in fig. 5b, from the outer side; × 53.

— 5i. Left third thoracic leg of the female shown fig. 5b, from the outer side; × 53.

— 5k. Left seventh thoracic leg of the last-named female, from the outer side; × 53.

— 5l. Two posterior abdominal segments with left uropod of the last-named female, from the left side; × 68.

— 5m. Two posterior abdominal segments with uropods of another female without marsupium, from below; × 66.

— 5n. Front end of the head with left antennula and antenna of a subadult male, from the left side; × 61.

— 5o. Posterior part of the thorax, seventh left thoracic leg and abdomen with pleopods and left uropod of a subadult male, from the left side; × 36.

Fig. 6. *Leptognathia multiserrata* n. sp.

Fig. 6a. Right antennula and antenna of a female without marsupium, from the outer side; × 85.

— 6b. Carpus and chela of right cheliped of the same female, from the outer side; × 85.

— 6c. Second right thoracic leg of the same female, from the outer side; × 85.

— 6d. Sixth right thoracic leg of the same female, from the outer side; × 85.

— 6e. Five posterior abdominal segments with the right uropod and the pleopod of fifth segment of the same female, from the outer side; × 46. Pleopods of second, third and fourth segments omitted.

Fig. 7. *Leptognathia Sarsii* H. J. Hansen.

Fig. 7a. Anterior part of the cephalothorax of a female from Klaksvig (Færoe Islands), from the outer side; × 65.

— 7b. Left chela of an other female from the same locality, from the outer side; × 85.

— 7c. Left second thoracic leg of a third female from the same locality, from the outer side; × 58.

— 7d. Left seventh thoracic leg of the last-named female, from the outer side; × 58.

— 7e. Abdomen with left uropod and the pleopod of second segment of a female from the same locality, from the left side; × 39. Four pleopods omitted in order to show the ventral protuberances.

— 7f. End of abdomen with left uropod — setæ omitted — of another female from the same locality, from the left side; × 55.

Plate VII.

Fig. 7. *Leptognathia gracilis* Kröyer.

Fig. 1 a. Anterior part of the cephalothorax with appendages of a female, from the left side; × 65.
— 1 b. Left chela of a subadult male, from the outer side; × 84.
— 1 c. Distal part of left second thoracic leg of a female, from the outer side; × 80.
— 1 d. Left uropod of a female, from the outer side; × 80.

Fig. 2. *Leptognathia Hanseni* Vanhöffen.

Fig. 2 a. Anterior part of the cephalothorax with appendages of a female from the mouth of the Ameralik Fjord, from the left side; × 63.
— 2 b. Left second thoracic leg of the same female, from the outer side; × 76.
— 2 c. Left sixth thoracic leg of the same female, from the outer side; × 76.
— 2 d. Five posterior abdominal segments with left fourth pleopod and left uropod of a female from the same locality, from the left side; × 41.
— 2 e. Left cheliped of a subadult male from the same locality, from the outer side; × 76.
— 2 f. Anterior part of the cephalothorax with appendages of an adult male from the mouth of the Ameralik Fjord, from the left side; × 90.
— 2 g. Major part of the left chela of the same male, from the outer side; × 180.
— 2 h. Distal part of the hand with the base of the fingers of the same chela, from the inner side; × 170.
— 2 i. Left second thoracic leg of the same male, from the outer side; × 90.
— 2 k. Major distal part of left seventh thoracic leg of the same male, from the outer side; × 90.
— 2 l. Posterior end of abdomen with left uropod of the same female, from the outer side; × 90.

Fig. 3. *Leptognathia longiremis* Lilljeborg.

Fig. 3 a. Anterior part of the cephalothorax with appendages of a female without marsupium from the "Ingolf" Stat. 25, from the outer side; × 62.
— 3 b. Left second thoracic leg of the same female, from the outer side; × 62.
— 3 c. Distal part of left fifth thoracic leg of the same female, from the outer side; × 62.
— 3 d. Abdomen with left fourth pleopod and left uropod of the same female, from the left side; × 40. The other pleopods omitted in order to show the ventral tubercles of the segments.
— 3 e. End of abdomen with left uropod — setæ omitted — of the same specimen, from the outer side; × 92.

Fig. 4. *Leptognathia inermis* n. sp.

Fig. 4 a. Anterior part of the cephalothorax with appendages of an ovigerous female, from the "Ingolf" Stat. 115, from the left side; × 86.
— 4 b. Distal half of left cheliped of another female from the same station, from the outer side; × 86.
— 4 c. Left second thoracic leg of the specimen shown in fig. 4 a, from the outer side; × 86.
— 4 d. Major distal part of left second thoracic leg of another female, from the outer side; × 86.

Fig. 4e. Left sixth thoracic leg of the female possessing the chela shown in fig. 4b, from the inner side; × 86.

— 4f. Abdomen with second and fifth left pleopods and left uropod of the female shown in fig. 4a, from the left side; × 82.

— 4g. Left cheliped of a female from Cape Dalton, from the left side; × 84. The movable finger differs from that in specimens from other localities (figs. 4a and 4b) in having three feeble indentations on the anterior margin.

Fig. 5. *Leptognathia brachiata* n. sp.

Fig. 5a. Carapace with antennulæ and second thoracic segment of a female without marsupium from the "Ingolf" Stat. 25, from above; × 35.

— 5b. Cephalothorax and second thoracic segment with appendages of a female with marsupium from the "Ingolf" Stat. 25, from the left side; × 47.

— 5c. Left antennula and antenna of the last-named specimen, from the outer side; × 85.

— 5d. Left cheliped of the last-named specimen, from the outer side; × 85.

— 5e. Left second thoracic leg of a female without marsupium from the same station, from the outer side; × 85.

— 5f. Left sixth thoracic leg of the last-named female, from the outer side; × 85.

— 5g. Three posterior abdominal segments of the specimen mentioned at fig. 5a, from above; × 46.

— 5h. Abdomen with appendages of a female with marsupium from the "Ingolf" Stat. 25, from the left side; × 46.

Fig. 6. *Leptognathia alba* n. sp.

Fig. 6a. Left antennula and antenna of the single specimen, from the outer side; × 55.

— 6b. Left cheliped, from the outer side; × 85.

— 6c. Left second thoracic leg, from the outer side; × 58.

— 6d. Left seventh thoracic leg, from the outer side; × 58.

— 6e. Abdomen with left fifth pleopod and left uropod, from the outer side, × 33. The other pleopods omitted in order to show the characteristic ventral tubercles.

Fig. 7. *Leptognathia hastata* n. sp.

Fig. 7a. Left antennula and antenna of a female without marsupium from the "Ingolf" Stat. 102, from the outer side; × 62.

— 7b. Left cheliped of the same specimen, from the outer side; × 62.

— 7c. Left second thoracic leg of the same specimen, from the outer side; × 88.

— 7d. Left fifth thoracic leg of the same specimen, from the outer side; × 88.

— 7e. Distal part of left seventh thoracic leg of the same specimen, from the outer side; × 172.

— 7f. Abdomen with left first and fifth pleopods and left uropod (with the setæ omitted) of the same specimen, from the left side; × 40.

— 7g. End of abdomen with left uropod of the same specimen, from the outer side; × 65.

— 7h. Three posterior segments of the abdomen and left uropod — the setæ omitted — of another female without marsupium from the "Ingolf" Stat. 102, from the left side; × 40.

Plate VIII.

Fig. 1. *Leptognathia armata* n. sp.

Fig. 1 a. Left antennula and antenna of a subadult male from the "Ingolf" Stat. 36, from the outer side; × 59.

— 1 b. Left cheliped of the same subadult male, from the outer side; × 59.

— 1 c. Left second thoracic leg of the same subadult male, from the outer side; × 59.

— 1 d. Distal part of second thoracic leg of the female from the "Ingolf" Stat. 22, from the outer side; × 100.

— 1 e. Left sixth thoracic leg of the subadult male, from the inner side; × 59.

— 1 f. Abdomen with second left pleopod and left uropod of the female, from the left side; × 32. The other pleopods omitted.

Fig. 2. *Leptognathia Amdrupii* n. sp.

Fig. 2 a. Left antennula of a female with marsupium, from the outer side; × 60.

— 2 b. Left cheliped of the same female, from the outer side; × 60.

— 2 c. Left second thoracic leg of the same female, from the outer side; × 60.

Fig. 3. *Leptognathia tuberculata* n. sp.

Fig. 3 a. Cephalothorax and second thoracic segment of a female without marsupium, from the left side; × 56.

— 3 b. Left second thoracic leg of a female with marsupium, from the outer side; × 83.

— 3 c. Left sixth thoracic leg of the last-named female, from the inner side; × 83.

— 3 d. Abdomen with first, third and fifth left pleopod and left uropod of a female, from the left side; × 48.

— 3 e. Left first pleopod of the female, from behind; × 140.

— 3 f. Left first pleopod of a subadult male, from in front; × 140.

Fig. 4. *Leptognathia uncinata* n. sp.

Fig. 4 a. Left antennula of a female without marsupium, from the outer side; × 93.

— 4 b. Left cheliped of the same specimen, from the outer side; × 93.

— 4 c. Left second thoracic leg of the same specimen, from the outer side; × 93.

— 4 d. Portion of abdomen with left fourth pleopod of the same female, from the outer side; × 88.

— 4 e. End of abdomen with left uropod of the same female, from the left side; × 93.

— 4 f. Major part of cephalothorax with appendages of an adult male, from the left side; × 83.

— 4 g. Left second thoracic leg of the same male, from the outer side; × 83.

— 4 h. Major part of left sixth thoracic leg of the same male; × 83.

— 4 i. Two posterior abdominal segments with left uropod of the same male, from the outer side; × 83.

Fig. 5. *Leptognathia manca* G. O. Sars.

Fig. 5 a. Cephalothorax and second segment of a female without marsupium, from the left side; × 86.

— 5 b. Abdomen of a female with marsupium, from the left side; × 86.

Fig. 5c. Cephalothorax of a subadult male, from the left side; × 86.
— 5d. Last thoracic segment (leg omitted) and abdomen with left uropod and fourth left pleopod — the other pleopods omitted — of the same subadult male, from the left side; × 60.

Fig. 6. *Leptognathia subæqualis* n. sp.

Fig. 6a. Female without marsupium from the "Ingolf" Stat. 139, from above; × 34.
— 6b. Cephalothorax and second segment with appendages of a female with marsupium from the same station, from the left side; × 89.
— 6c. Left cheliped of another female from the same station, from the outer side; × 135.
— 6d. Three posterior abdominal segments of the female shown in fig. 6b, from the left side; × 89.
— 6e. Four posterior abdominal segments with pleopods and left uropod of an immature male or more probably a female without marsupium from the "Ingolf" Stat. 4, from the left side; × 89.
— 6f. Left antennula and antenna of a subadult male from the "Ingolf" Stat. 139, from the left side; × 89.

Fig. 7. *Leptognathia ventralis* n. sp.

Fig. 7a. Female without marsupium from the "Ingolf" Stat. 115, from above; × 27.
— 7b. Cephalothorax and second segment — only the basal part of its left leg drawn — of a female with marsupium from the same station, from the left side; × 86.
— 7c. Mandibles of an immature male, from above; × 142. *l.* left mandible.
— 7d. Maxillipeds of the last-named specimen, from below; × 142.
— 7e. Left third thoracic leg of a female with marsupium from Stat. 115, from the outer side; × 86.
— 7f. Left seventh thoracic leg of the same female, from the outer side; × 86.
— 7g. Abdomen of a female from Stat. 115, from the left side; × 59.
— 7h. Left second thoracic leg of a female without marsupium from Stat. 38, from the outer side; × 86.
— 7i. Cephalothorax and second segment with appendages of a subadult male from Stat. 115, from the left side; × 86.
— 7k. Three posterior abdominal segments with left pleopods and uropod of a subadult male, from the outer side; × 86.

Plate IX.

Fig. 1. *Leptognathia tenella* n. sp.

Fig. 1a. Female without marsupium, from above; × 33.
— 1b. Cephalothorax and second thoracic segment of a female without marsupium, from the left side; × 95.
— 1c. Left seventh thoracic leg of the same female, from the outer side; × 95.
— 1d. Abdomen of the same female, from the left side; × 95.
— 1e. Three posterior abdominal segments of the female shown in fig. 1a, from above; × 84. Setæ of right uropod omitted.

Fig. 2. *Leptognathia acanthifera* n. sp.

Fig. 2a. Female without marsupium, from above; × 31.

Fig. 2 b. Cephalothorax and the two following segments of a female without marsupium, from the left side; × 84.

— 2 c. Left fifth thoracic leg, from the outer side; × 84.

— 2 d. Abdomen of the female shown in fig. 2 b, from the left side; × 84.

Fig. 3. *Leptognathia breviremis* Lilljeborg.

Fig. 3 a. Cephalothorax and second thoracic segment of a female without marsupium from the "Ingolf" Stat. 117, from the left side; × 83. A minute parasitic Copepod is attached to the outer side of second joint of second thoracic leg.

— 3 b. Four posterior abdominal segments with left fourth pleopod and left uropod of the above-named female, from the left side; × 83.

— 3 c. Abdomen of an ovigerous female from Norway, from the left side; × 83. Pleopods excepting the third and the setæ of the uropod omitted.

— 3 d. Anterior part with appendages of an adult male from the "Ingolf" Stat. 36, from the left side; × 84.

— 3 e. Left sixth thoracic leg of the same male, from the outer side; × 84.

— 3 f. Sixth and seventh thoracic and all abdominal segments of the same male, from the left side; × 84. Thoracic legs and the pleopods of first, second and fourth abdominal segments omitted.

— 3 g. Sixth abdominal segment with left uropod of an adult male from the "Ingolf" Stat. 101 from the left side; × 80.

Fig. 4. *Leptognathia crassa* n. sp.

Fig. 4 a. Female without marsupium, from above; × 29.

— 4 b. Cephalothorax and second thoracic segment with appendages of a female, from the left side; × 60.

— 4 c. Left sixth thoracic leg of another female, from the outer side; × 79.

— 4 d. Abdomen of the female shown in fig. 4 b from the left side; × 60. Pleopods omitted excepting the third.

— 4 e. Three posterior abdominal segments of the last-named female, from below; × 60. The pleopods on the left side of the figure omitted.

Fig. 5. *Leptognathia polita* n. sp.

Fig. 5 a. Female without marsupium, from above; × 17.

— 5 b. Cephalothorax and second thoracic segment of the same female, from the left side; × 36. Left second thoracic leg omitted excepting its most proximal part.

— 5 c. Major part of left chela of the same specimen, from the outer side; × 80.

— 5 d. Right second thoracic leg of the same female, from the outer side; × 50.

— 5 e. Left sixth thoracic leg of the same female, from the outer side; × 50.

— 5 f. Five posterior abdominal segments with left fifth pleopod and left uropod of the same specimen, from the outer side; × 36.

Fig. 6. *Leptognathia vicina* n. sp.

Fig. 6a. Subadult male from the "Ingolf" Stat. 28, from above; × 25.
— 6b. Cephalothorax and second thoracic segment with appendages of a female without marsupium from the same station, from the left side; × 57.
— 6c. Mandibles of a female, from below; × 90. *l.* left mandible.
— 6d. Molar processes of the same mandibles, from below; × 315.
— 6e. Left maxillula of the same female, from below; × 90.
— 6f. Left cheliped, removed from the animal and seen from the outer side; × 65.
— 6g. Right sixth thoracic leg of a female, from the outer side; × 57.
— 6h. Four posterior abdominal segments with fourth pleopod and left uropod of the female shown in fig. 4b, from the outer side; × 57.
— 6i. Left antennula of a subadult male from Lat. 66° 49′ N., Long. 56° 28′ W., from the left side; × 82.

Plate X.

Fig. 1. *Leptognathia profunda* n. sp.

Fig. 1a. Female without marsupium, from above; × 26.
— 1b. Anterior half of a female without marsupium, from the left side; × 56.
— 1c. Left cheliped of another female, from the outer side; × 97.
— 1d. Left second thoracic leg of a third female, from the outer side; × 97.
— 1e. Left sixth thoracic leg of the last-named specimen, from the outer side — distal half of the leg somewhat turned; × 97.
— 1f. Left first pleopod of a female, from in front; × 95.
— 1g. Four posterior abdominal segments with appendages of the female shown in fig. 1b, from the left side; × 56.
— 1h. Left uropod of another female, from the outer side; × 97.

Fig. 2. *Leptognathia latiremis* n. sp.

Fig. 2a. Female without marsupium from the "Ingolf" Stat. 58, from above; × 26.
— 2b. Left antennula and antenna of a female without marsupium from the same station, from the outer side; × 86.
— 2c. Left antennula of the female shown in fig. 2a, from above; × 48.
— 2d. Left antennula of an immature male from the same station, from above; × 48.
— 2e. Labrum and both mandibles of a female; from below; × 235.
— 2f. Maxillipeds of the last-named specimen, from below; × 235.
— 2g. Left cheliped of a female without marsupium, from the outer side; × 86.
— 2h. Distal part of left second thoracic leg of the last-named specimen, from the outer side; × 86.
— 2i. Left third thoracic leg of the last-named specimen, from the outer side; × 86.
— 2k. Left seventh thoracic leg of the same specimen, from the outer side; × 86. The distal half of the leg somewhat turned.

Fig. 2 l. First left pleopod of a female, from in front; × 86.
— 2 m. Posterior part of abdomen with right uropod of a female, from above; × 52.
— 2 n. Posterior part of abdomen of a young specimen with the seventh pair of thoracic legs and the pleopods still wanting, from the left side; × 86.

Fig. 3. *Leptognathia glacialis* n. sp.

Fig. 3 a. Distal half of left cheliped, from the outer side; × 86.
— 3 b. Three posterior abdominal segments, from the left side; × 86.

Fig. 4. *Haplocope lincaris* n. sp.

Fig. 4 a. A full-grown female, from above; × 32. The right uropod in this specimen was abnormally short.
— 4 b. Cephalothorax and second thoracic segment with appendages of a female without marsupium, from the left side; × 90.
— 4 c. Mandibles of a female, from below; × 200. *l.* left mandible.
— 4 d. Right sixth thoracic leg of the female shown in fig. 4 b, from the outer side; × 90.
— 4 e. Third left pleopod of a female with marsupium, from in front; × 108.
— 4 f. Major part of abdomen with fourth and fifth left pleopod — the other pleopods omitted — and left uropod of a female with marsupium, from the left side; × 75.

Fig. 5. *Leptognathiella abyssi* n. gen., n. sp.

Fig. 5 a. Female without marsupium, from above; × 26.
— 5 b. Anterior part of the same female, from above; × 56.
— 5 c. Abdomen and posterior part of the thorax of the same female, from above; × 44.
— 5 d. Left antennula and antenna of a female, from the outer side; × 82.
— 5 e. Left sixth thoracic leg of a female, from the outer side; × 82.
— 5 f. Abdomen and major part of last thoracic segment of a female, from the left side; × 56.
— 5 g. Cephalothorax and two anterior thoracic segments with appendages of a subadult male, from the left side; × 82.
— 5 h. Left fifth thoracic leg of the subadult male, from the outer side; × 82.
— 5 i. Abdomen with fourth and fifth left pleopod and uropod of the subadult male; × 56. Anterior pairs of pleopods omitted.

Fig. 6. *Cryptocope Voringii* G. O. Sars.

Fig. 6 a. Cephalothorax of a female without marsupium from the "Ingolf" Stat. 138, from the left side; × 31.
— 6 b. Distal part of the chela of the same female, from the outer side; × 53.
— 6 c. Left third thoracic leg of the same female, from the outer side; × 31.
— 6 d. Abdomen of the same female without marsupium, from the left side; × 31.

Plate XI.

Fig. 1. *Cryptocope arctica* H. J. Hansen.

Fig. 1 a. Female without marsupium from the "Ingolf" Stat. 25, from above; × 26.

— 1 b. Cephalothorax and second thoracic segment with appendages of an ovigerous female from Henry Land, from the left side; × 47.

— 1 c. Left chela of a female without marsupium from the "Ingolf" Stat. 25, from the outer side; × 77.

— 1 d. Left sixth thoracic leg of the last-named specimen, from the outer side; × 50.

— 1 e. Abdomen and last thoracic segment of the female shown in fig. 1 b, from the left side; × 47. The thoracic leg excepting its basal part and second, third and fourth left pleopod omitted.

— 1 f. Abdomen with small pleopods — second, third and fourth pleopod omitted — of a large female without marsupium from the "Ingolf" Stat. 25, from the left side; × 52.

— 1 g. Left antennula of a subadult male from Henry Land, from the left side; × 47.

— 1 h. Abdomen — left second, third and fifth pleopod omitted — and posterior part of the thorax of a subadult male from Henry Land, from the left side; × 47.

Fig. 2. *Cryptocope arctophylax* Norm. & Stebb.

Fig. 2 a. Subadult male from Stat. 24, from above; × 16.

— 2 b. Left antennula of the same subadult male, from the outer side; × 57.

— 2 c. Major part of left chela of the same subadult male, from the outer side; × 56.

— 2 d. Abdomen — first, second and fourth pleopod omitted — and seventh thoracic segment of the same subadult male, from the left side; × 32.

— 2 e. Left antennula and antenna of an immature female from Stat. 24, from the left side; × 57.

— 2 f. Distal part of left sixth thoracic leg of the same immature female, from the outer side; × 80.

— 2 g. Abdomen and end of thorax of the same immature female, from the left side; × 36.

— 2 h. Cephalothorax and anterior part of thorax of an adult male from Stat. 36, from the left side; × 35.

— 2 i. Left chela of the adult male, from the outer side; × 61.

— 2 k. Major part of abdomen — the three anterior pleopods omitted — of the same adult male, from the left side; × 33.

Fig. 3. *Tanaella ochracea* n. sp.

Fig. 3 a. Female without marsupium, from above; × 21.

— 3 b. Cephalothorax and the two anterior thoracic segments with appendages of the same female, from the left side; × 46.

— 3 c. Major part of left chela of the same specimen, from the outer side; × 85.

— 3 d. Distal part of left third thoracic leg of the same female, from the outer side; × 80.

— 3 e. Left seventh thoracic leg of the same female, from behind; × 80.

— 3 f. Abdomen — first, third and fourth pleopod omitted — and seventh thoracic segment of the same female; × 32.

Fig. 4. *Tanaella unguicillata* Norm. & Stebb.

Fig. 4a. Cephalothorax and two anterior thoracic segments with appendages of a female without marsupium, from the left side; × 40.

— 4b. Major part of left chela of the same female, from the outer side; × 85.

— 4c. Left sixth thoracic leg of the same female, from in front; × 80.

— 4d. Last thoracic segment and abdomen of the same female, from the left side; × 31.

Fig. 5. *Strongylura minima* n. sp.

Fig. 5a. Subadult male, from above; × 55.

— 5b. Cephalothorax and two anterior thoracic segments with appendages of the subadult male, from the left side; × 95.

— 5c. Four posterior abdominal segments — third and fourth left pleopod omitted — from the side; × 95.

— 5d. Cephalothorax of a female without marsupium, from the left side; × 91.

Plate XII.

Fig. 1. *Strongylura cylindrata* G. O. Sars.

Fig. 1a. Female without marsupium from the "Ingolf" Stat. 113, from above; × 14.

— 1b. Cephalothorax of a female without marsupium from the "Ingolf" Stat. 113, from the left side; × 52.

— 1c. Left third thoracic leg of the female from Stat. 113, from the outer side; × 81.

— 1d. Left seventh thoracic leg of the female from Stat. 113, from the outer side; × 81.

— 1e. Cephalothorax and second thoracic segment of the subadult male from the "Ingolf" Stat. 24, from the left side; × 60.

— 1f. Posterior part of abdomen of the subadult male from Stat. 24, from the left side; × 60.

— 1g. Left antennula and antenna of a female without marsupium from Norway, from the left side; × 60.

— 1h. Left second thoracic thoracic leg of the same female from Norway, from the outer side; × 81.

— 1i. Left sixth thoracic leg of the same female from Norway, from behind; × 81.

— 1k. Last abdominal segment of the same female from Norway, from the left side; × 58.

— 1l. Left pleopod of the abdomen shown in fig. 1k, from the outer side: × 175.

Fig. 2. *Strongylurella indivisa* n. gen., n. sp.

Fig. 2.a. Female without marsupium, from above; × 36.

— 2b. Cephalothorax and second thoracic segment of the same specimen, from the left side; × 91.

— 2c. Left sixth thoracic leg of the same specimen, from the outer side; × 91.

— 2d. Five abdominal segments of the same female, from the left side; × 80.

— 2e. Four posterior abdominal segments of the same female, from above; × 54.

Fig. 3. *Paranarthrura insignis* n. gen., n. sp.

Fig. 3a. Female without marsupium from the "Ingolf" Stat. 25, from above; × 21.

Fig. 3b. Cephalothorax and anterior thoracic segments of a female without marsupium from the same station, from the left side; × 56.
— 3c. Labrum and mandibles of a female, from below; × 130.
— 3d. Both mandibles in another position, from below; × 200.
— 3e. Left maxillula of the last-named female, from below; 130.
— 3f. Maxillipeds — epipods omitted — of the same female, from below; × 130.
— 3g. Left seventh thoracic leg of an ovigerous female, from behind; × 56.
— 3h. Seventh thoracic segment — the leg omitted — and abdomen of a female, from the left side; × 47.
— 3i. Seventh thoracic segment and abdomen of a female, from above; × 42.
— 3k. Left antennula and antenna of a subadult male from Stat. 25, from the left side; × 56.
— 3l. Left cheliped of a subadult male, from the left side; × 81.
— 3m. Seventh thoracic segment and abdomen of a subadult male from Stat. 25, from the left side; × 47. Left thoracic leg and third and fourth pleopods omitted.

Fig. 4. *Paranarthrura subtilis* n. sp.

Fig. 4a. Female without marsupium, from above × 34.
— 4b. Cephalothorax and second thoracic segment with appendages of a female without marsupium, from the left side; × 89.
— 4c. Seventh thoracic segment and abdomen of the same female without marsupium, from the left side; × 89.
— 4d. Seventh thoracic segment and abdomen of another female without marsupium, from above; × 89.

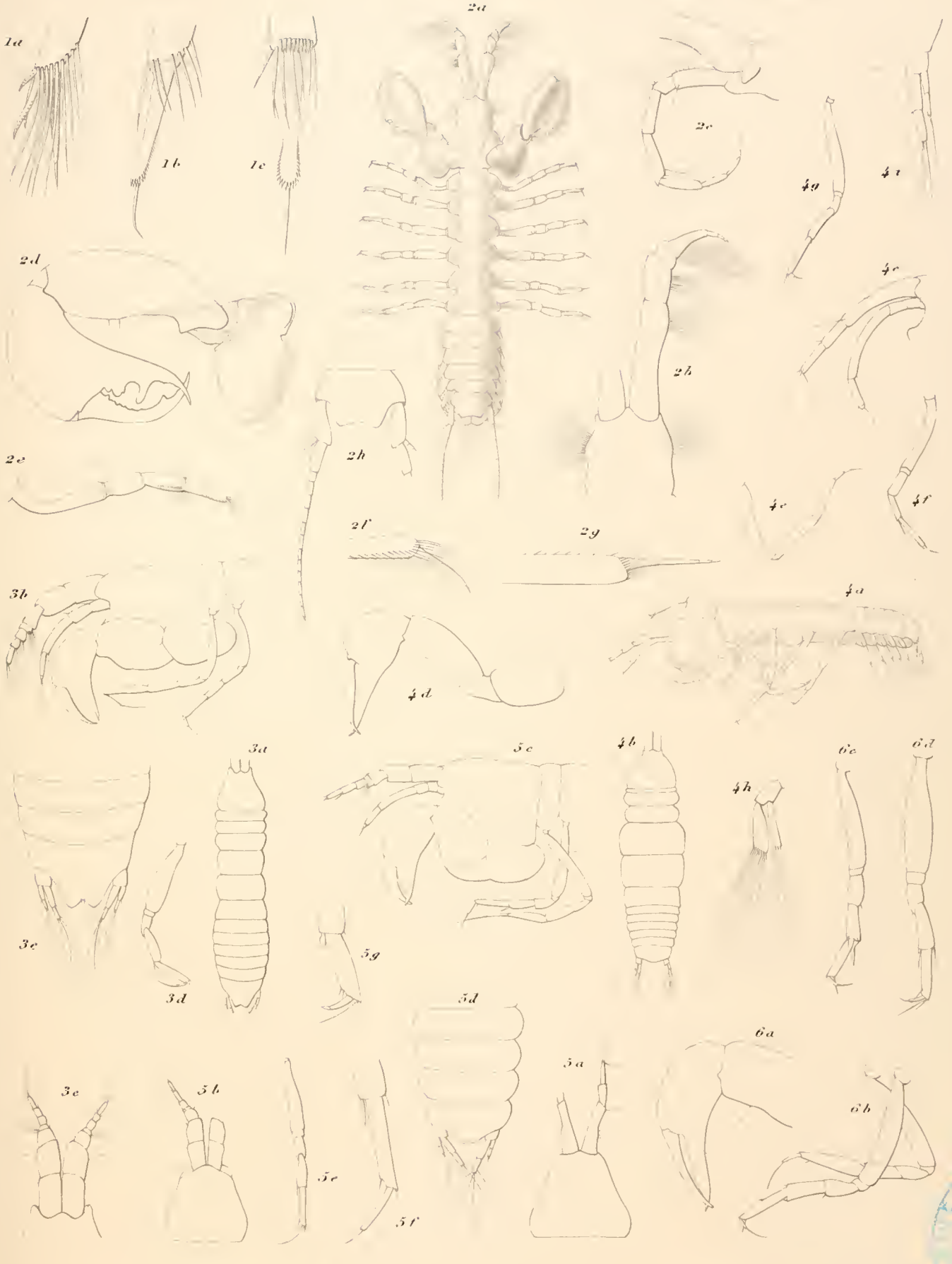
Fig. 5. *Paranarthrura clavipes* n. sp.

Fig. 5a. Young specimen with the seventh thoracic segment only half developed, from above; × 35.
— 5b. Cephalothorax and second left leg of an immature male, from the left side; × 82.
— 5c. Abdomen and posterior part of the thorax of the same immature male, from the left side; × 82. Major part of sixth leg and first, second and fourth pleopod omitted.

1. Apseudes vicinus n. sp. *2. A. tenuis n. sp.* *3. A. gracilis Norm. & Stebb.* *4. A. gracillimus n. sp.*

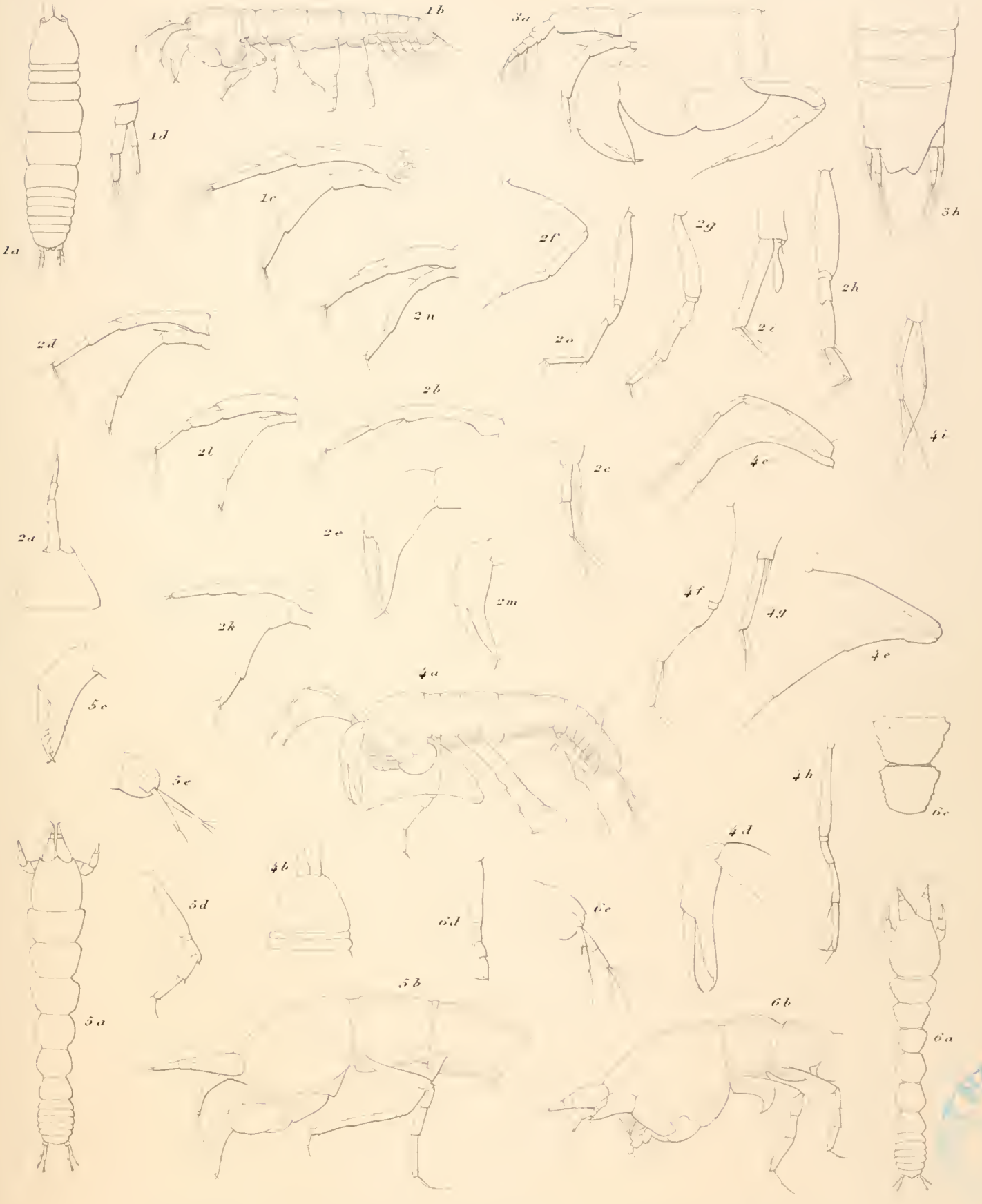
5. Heterotanais groculandicus n. sp. *6. Neotanais serratispinosus Norm. & Stebb.*

H.J.Hansen del *T.N.Müller sc.*



1. *Neotanais serratispinosus* Norm. & Stebb. 2. *N. giganteus* n. sp. 3 *Pseudotanais forcipatus* Lilljeb.
4. *P. abyssi* n. sp. 5. *P. Lilljeborgii* G.O.S. 6 *P. oculatus* n. sp.

H.J. Hansen del. T.N. Möller sc.



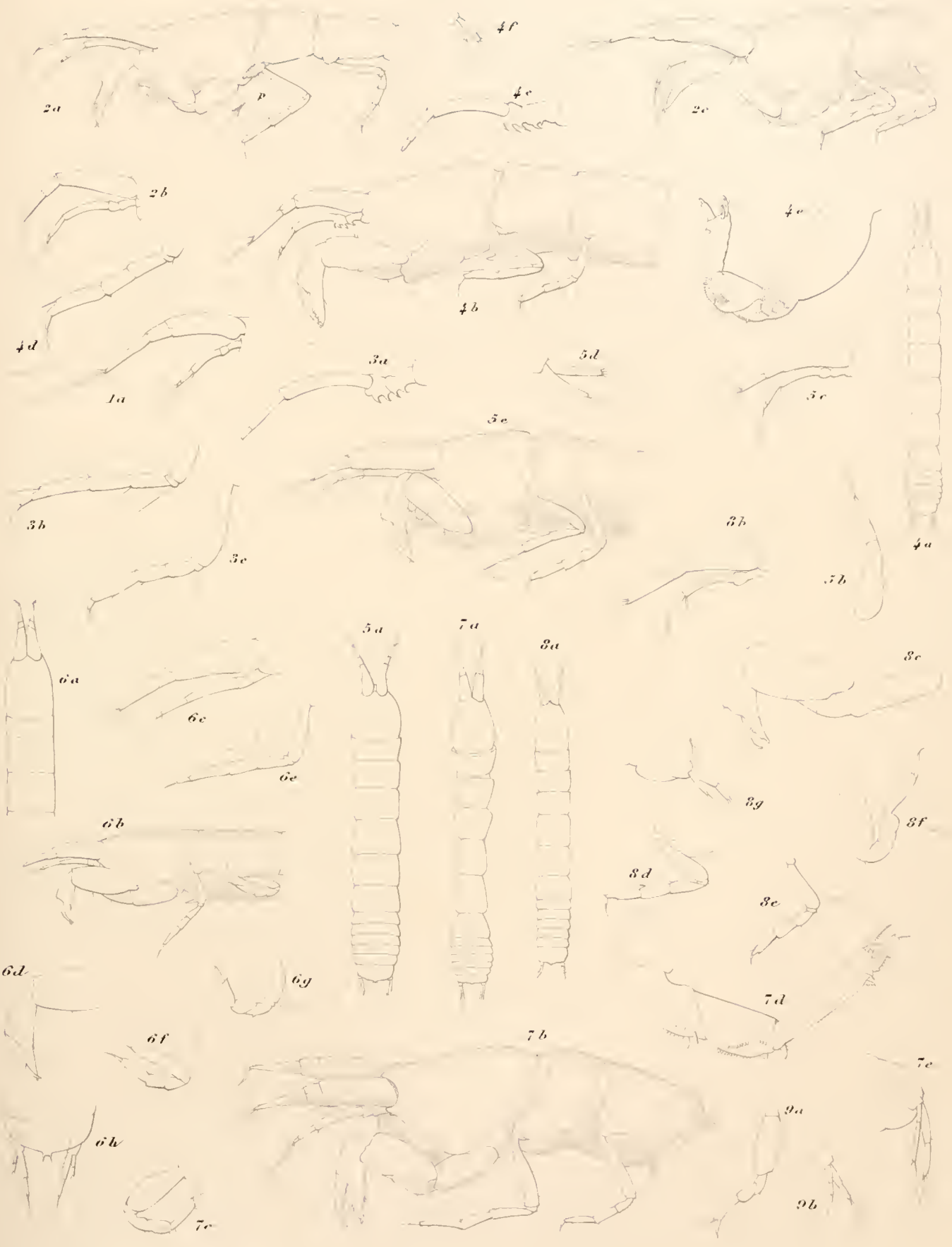
1. *Pseudolanais oculatus n. sp.* 2. *P. affinis H.J.H.* 3 ♀ *P. affinis H.J.H.* ♂ *ad.*
4. *P. longipes n. sp.* 5. *Typhlolanais irregularis n. sp.* 6. ♂ *macrocephala n. sp.*

H.J.Hansen del. *T.N. Möller sc.*

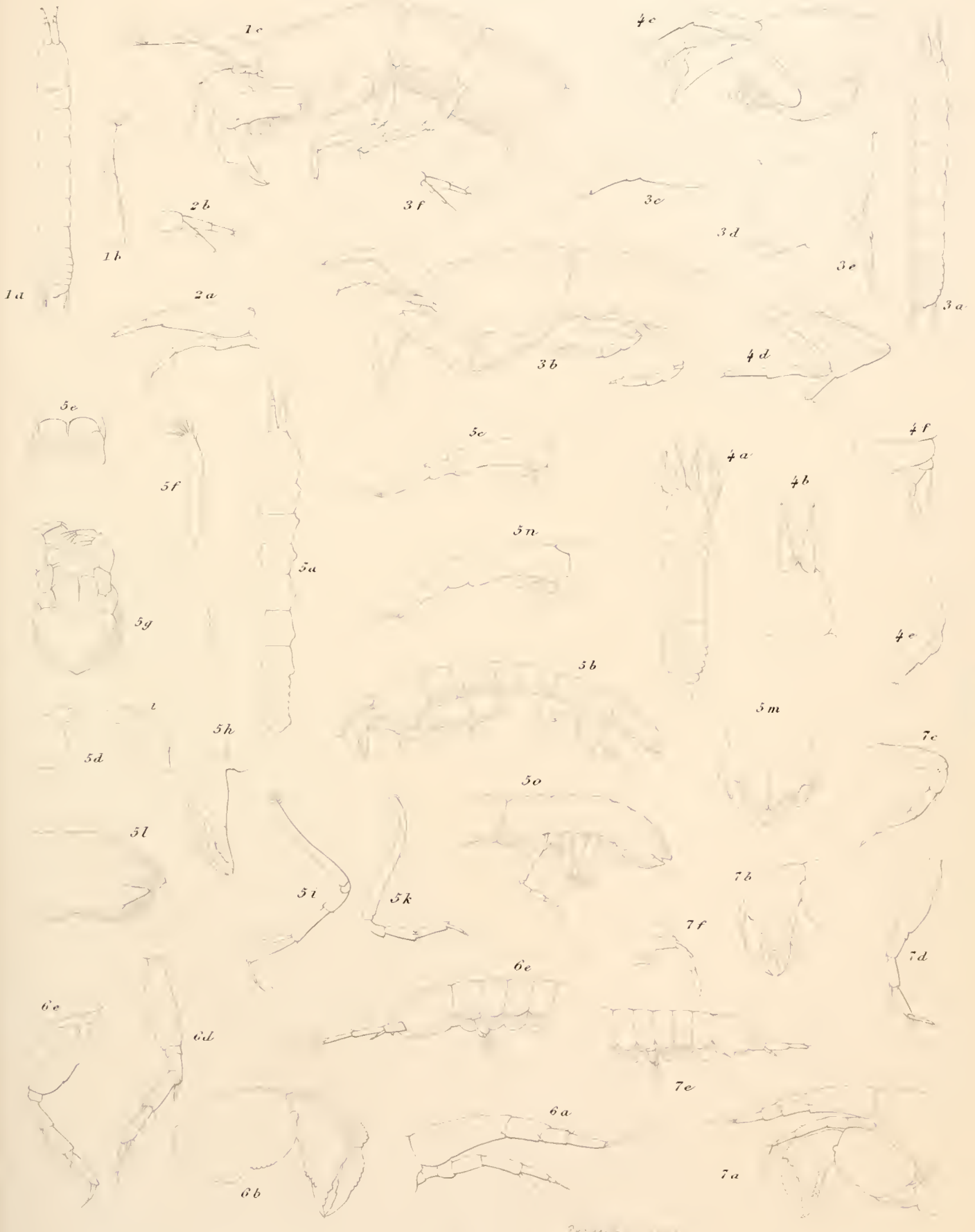
1. Typhlotanais pulcher n. sp. 2. T. gracilipes n. sp. 3. T. mucronatus n. sp. 4. T. eximius n. sp.

5. T. penicillatus G.O.S. 6. T. inermis n. sp. 7. T. variabilis n. sp.

H.J. Hansen del. *T.N. Møller sc.*



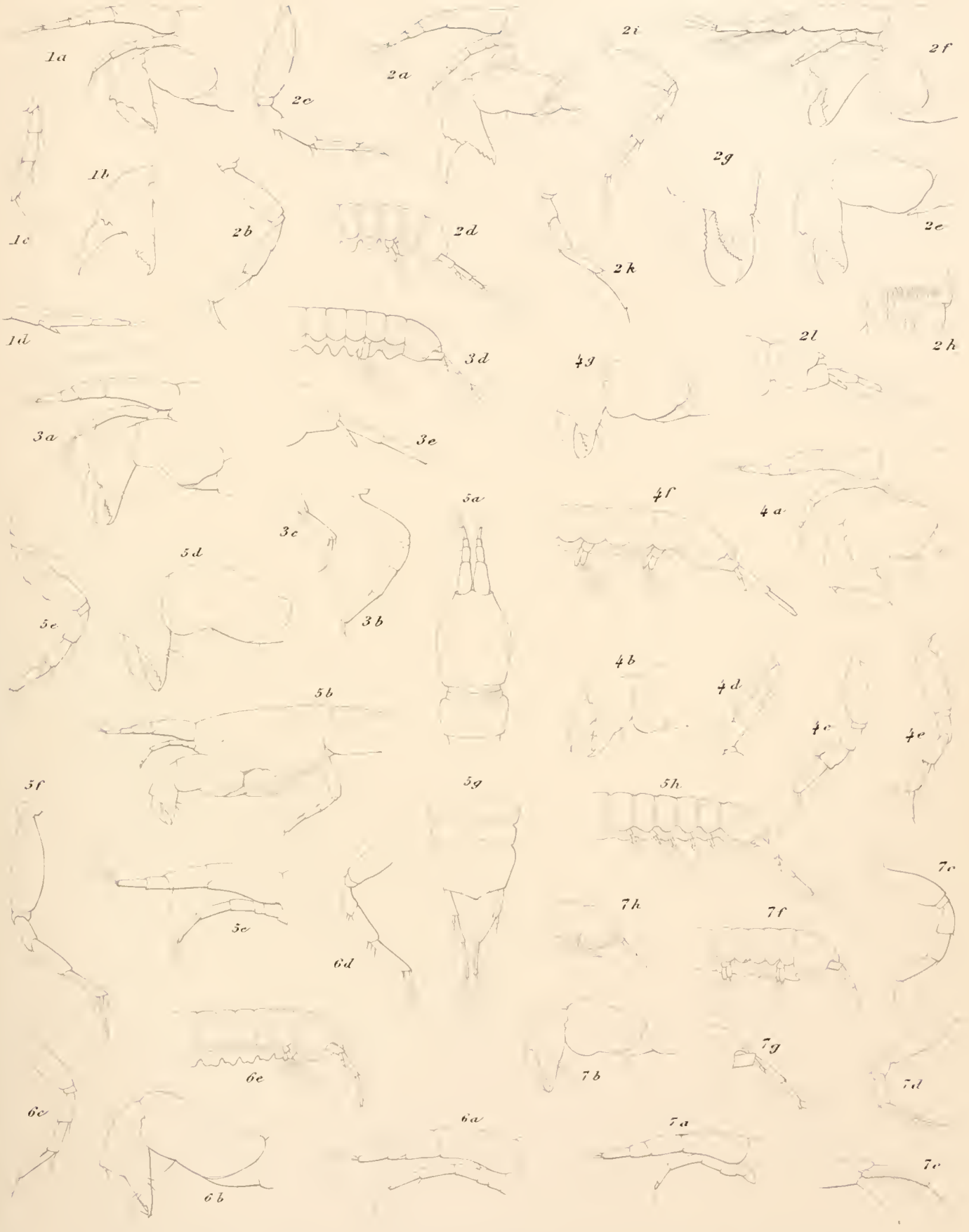
1. Typhlotanais mucronatus n. sp. *2. T. variabilis n. sp* *3. T. tenuicornis G.O.S.* *4. T. trispinosus n. sp.*
5. T. profundus n. sp. *6. T. spinicauda n. sp.* *7. T. grandis n. sp.* *8. T. plebejus n. sp.* *9. T. inaequipes n. sp.*



1. Typhlotanais inæquipes n. sp. *2. T. finmarchicus G.O.S.* *3. T. mixtus n. sp.* *4. T. solidus n. sp.*

5. Agathotanais Ingolfi n. gen. n. sp. *6. Leptognathia multiserrata n. sp.* *7. L. Sarsii H.J.H.*

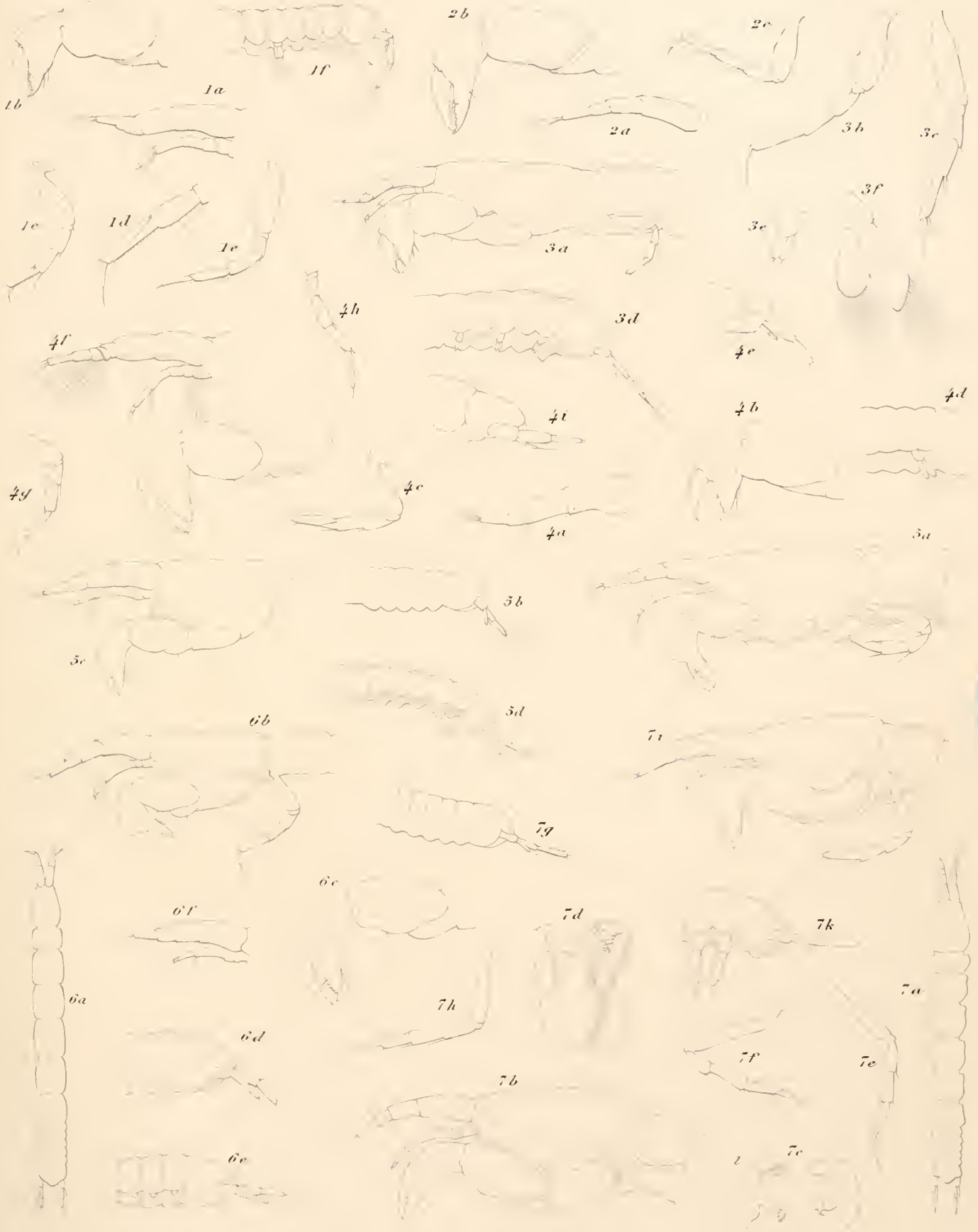
H.J. Hansen del. *T.N. Möller sc.*



1 Leptognathia gracilis Kr. 2. L. Hanseni Vanhöffen. 3. L. longiremis Lilljeb. 4. L. inermis n. sp.
5 L. brachiata n. sp. 6. L. alba n. sp. 7. L. hastata n. sp.

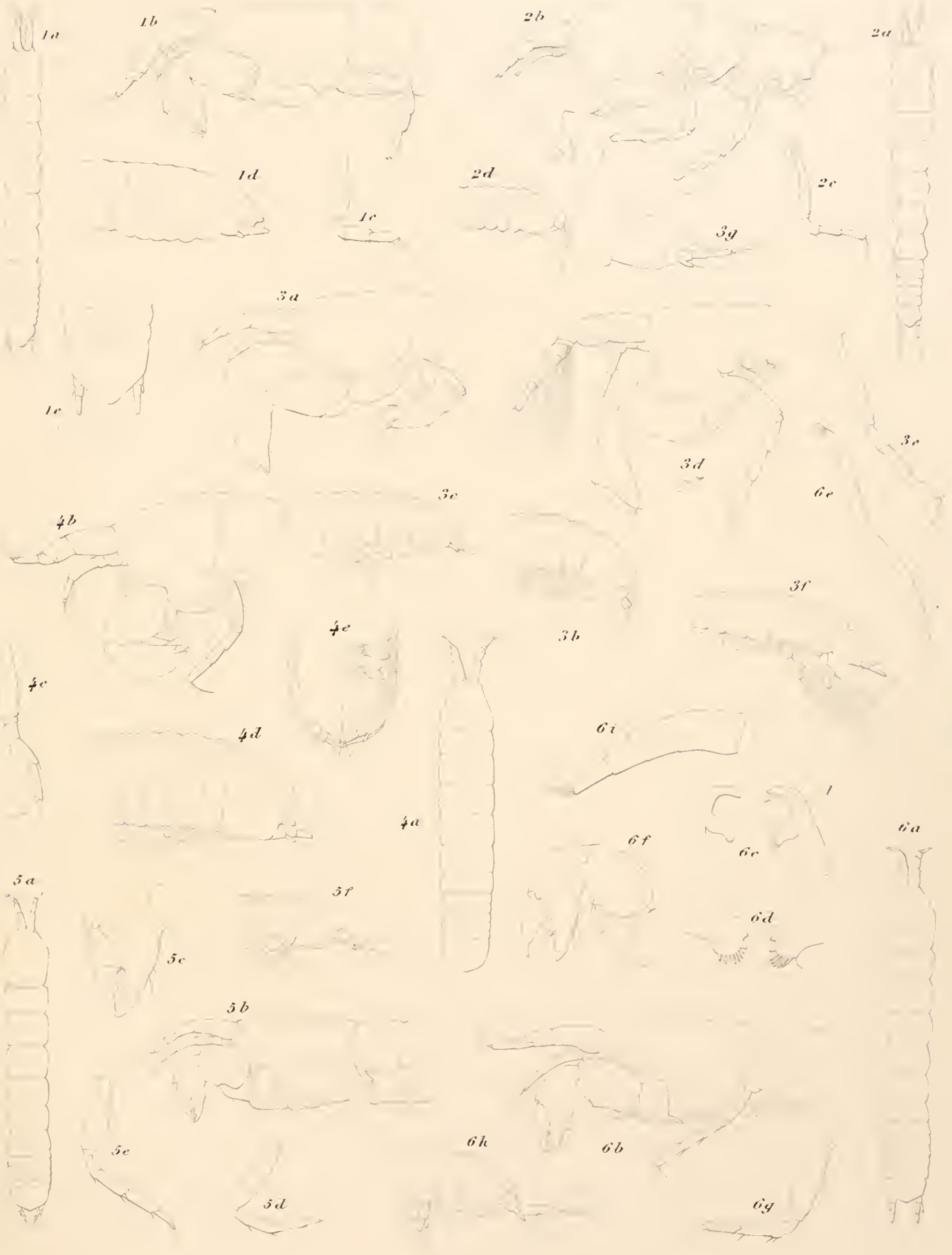
H.J Hansen del.

T.N Moller sc.



1. Leptognathia armata n. sp. 2. L. Andrupii n. sp. 3. L. tuberculata n. sp. 4. L. uncinata n. sp. 5. L. manca Goes. 6. L. subæqualis n. sp. 7. L. ventralis n. sp.

H J Hansen del *T. N. Møller sc.*



1 Leptognathia tenella n. sp. 2 L. acanthifera n. sp. 3 L. brevirostris Lilljeb. 4 L. crassa n. sp. 5 L. polita n. sp. 6 L. vicina n. sp.

H.J. Hansen del. *T.N. Møller sc.*

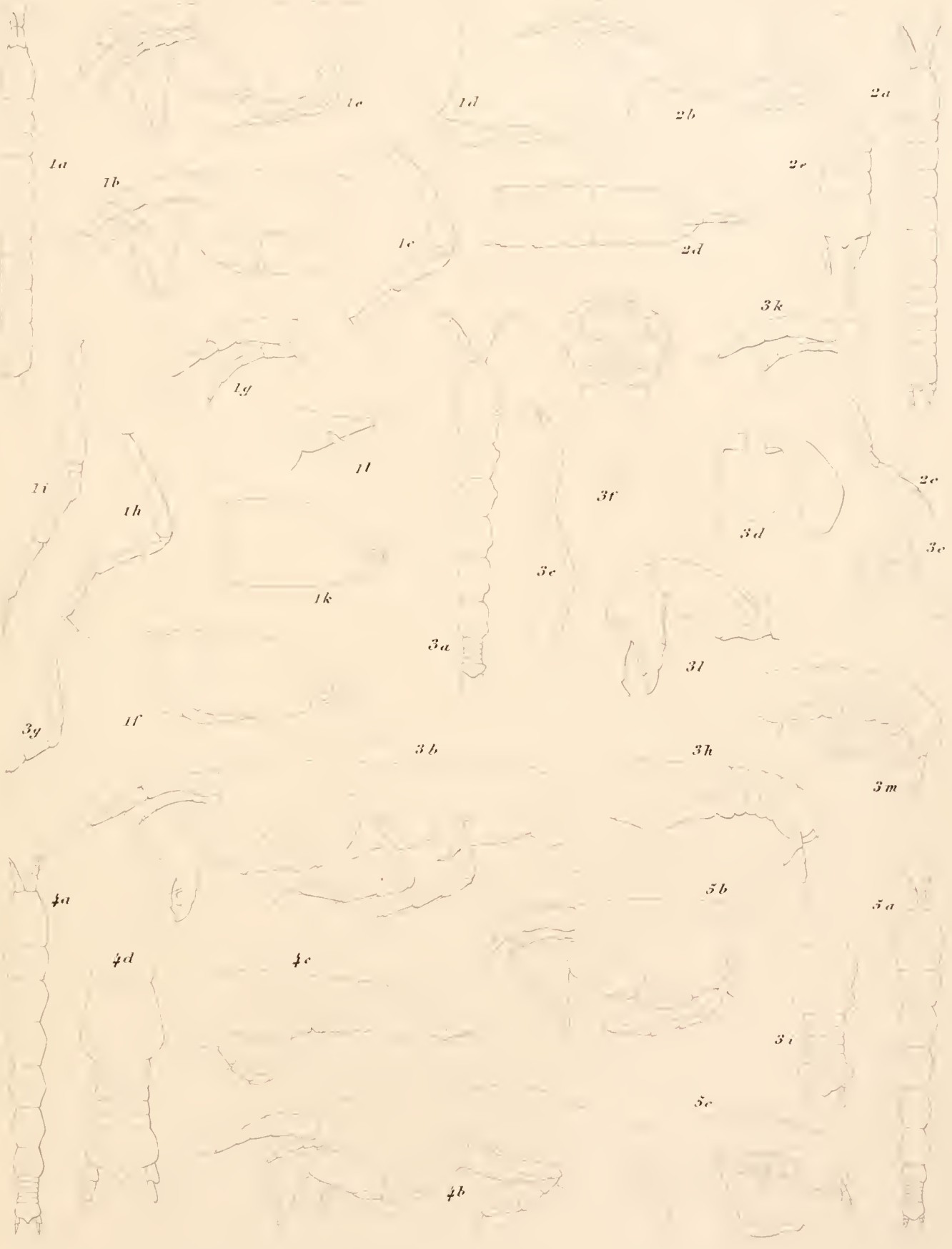
1. *Leptognathia profunda* n. sp. 2. *L. latirostris* n. sp. 3. *L. glacialis* n. sp. 4. *Haplocope linearis* n. sp. 5. *Leptognathiella abyssi* n. gen. n. sp. 6. *Cryptocope Vöringii* G.O.S.

H.J.Hansen del. T.N. Möller sc.

1 Cryptocope arctica H.J.H. 2. C. arctophylax Norm. & Stebb. 3. Tanaella ochracea n. sp.

4. T. unguiculata Norm. & Stebb. 5. Strongylura minima n. sp.

H J Hansen del T.N. Möller sc



1. Strongylura cylindrata a.o.s. *2. Strongylurella indivisa n. gen., n. sp.* *3. Paranarthrura insignis n. gen., n. sp.*
4. P. subtilis n. sp. *5. P. clavipes n. sp.*

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	3°5	51	64° 15′	14° 22′	68	7°32
8	63° 56′	24° 40′	136	6°0	29	65° 34′	54° 31′	68	0°2	52	63° 57′	13° 32′	420	7°87
9	64° 18′	27° 00′	295	5°8	30	66° 50′	54° 28′	22	1°05	53	63° 15′	15° 07′	795	3°08
10	64° 24′	28° 50′	788	3°5	31	66° 35′	55° 54′	88	1°6	54	63° 08′	15° 40′	691	3°9
11	64° 34′	31° 12′	1300	1°6	32	66° 35′	56° 38′	318	3°9	55	63° 33′	15° 02′	316	5°9
12	64° 38′	32° 37′	1040	0°3	33	67° 57′	55° 30′	35	0°8	56	64° 00′	15° 09′	68	7°57
13	64° 47′	34° 33′	622	3°0	34	65° 17′	54° 17′	55		57	63° 37′	13° 02′	350	3°4
14	64° 45′	35° 05′	176	4°4	35	65° 16′	55° 05′	362	3°6	58	64° 25′	12° 09′	211	0°8
15	66° 18′	25° 59′	330	−0°75	36	61° 50′	56° 21′	1435	1°5	59	65° 00′	11° 16′	310	−0°1
16	65° 43′	26° 58′	250	6°1	37	60° 17′	54° 05′	1715	1°4	60	65° 09′	12° 27′	124	0°9
17	62° 49′	26° 55′	745	3°4	38	59° 12′	51° 05′	1870	1°3	61	65° 03′	13° 06′	55	0°4
18	61° 44′	30° 29′	1135	3°0	39	62° 00′	22° 38′	865	2°9	62	63° 18′	19° 12′	72	7°92
19	60° 29′	34° 14′	1566	2°4	40	62° 00′	21° 36′	845	3°3	63	62° 40′	19° 05′	800	4°0
20	58° 20′	40° 48′	1695	1°5	41	61° 39′	17° 10	1245	2°0	64	62° 06′	19° 00′	1041	3°1
21	58° 01′	44° 45′	1330	2°4	42	61° 41′	10° 17′	625	0°4	65	61° 33′	19° 00′	1089	3°0
22	58° 10′	48° 25′	1845	1°4	43	61° 42′	10° 11′	645	0°05	66	61° 33′	20° 43′	1128	3°3
23	60° 43′	56° 00′	Only the Plankton Net used		44	61° 42′	9° 36′	545	4°8	67	61° 30′	22° 30′	975	3°0

Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.	Station Nr.	Lat. N.	Long. W.	Depth in Danish fathoms	Bottom-temp.
68	62° 06′	22° 30′	843	3°4	92	64° 44′	32° 52′	976	1°4	118	68° 27′	8° 20′	1060	—1°0
69	62° 40′	22° 17′	589	3°9	93	64° 24′	35° 14′	767	1°46	119	67° 53′	10° 19′	1010	—1°0
70	63° 09′	22° 05′	134	7°0	94	64° 56′	36° 19′	204	4°1	120	67° 29′	11° 32′	885	—1°0
71	63° 46′	22° 03′	46			65° 31′	30° 45′	213		121	66° 59′	13° 11′	529	—0°7
72	63° 12′	23° 04′	197	6°7	95	65° 14′	30° 39′	752	2°1	122	66° 42′	14° 44′	115	1°8
73	62° 58′	23° 28′	486	5°5	96	65° 24′	29° 00′	735	1°2	123	66° 52′	15° 40′	145	2°0
74	62° 17′	24° 36′	695	4°2	97	65° 28′	27° 39′	450	5°5	124	67° 40′	15° 40′	495	—0°6
	61° 57′	25° 35′	761		98	65° 38′	26° 27′	138	5°9	125	68° 08′	16° 02′	729	—0°8
	61° 28′	25° 06′	829		99	66° 13′	25° 53′	187	6°1	126	67° 19′	15° 52′	293	—0°5
75	61° 28′	26° 25′	780	4°3	100	66° 23′	14° 02′	59	0°4	127	66° 33′	20° 05′	44	5°6
76	60° 50′	26° 50′	806	4°1	101	66° 23′	12° 05′	537	—0°7	128	66° 50′	20° 02′	194	0°6
77	60° 10′	26° 59′	951	3°6	102	66° 23′	10° 26′	750	—0°9	129	66° 35′	23° 47′	117	6°5
78	60° 37′	27° 52′	799	4°5	103	66° 23′	8° 52′	579	—0°6	130	63° 00′	20° 40′	338	6°55
79	60° 52′	28° 58′	653	4°4	104	66° 23′	7° 25′	957	1°1	131	63° 00′	19° 09′	698	4°7
80	61° 02′	29° 32′	935	4°0	105	65° 34′	7° 31′	762	—0°8	132	63° 00′	17° 04′	747	4°6
81	61° 44′	27° 00′	485	6°1	106	65° 34′	8° 54′	447	—0°6	133	63° 14′	11° 24′	230	2°2
82	61° 55′	27° 28′	824	4°1		65° 29′	8° 40′	466		134	62° 34′	10° 26′	299	4°1
83	62° 25′	28° 30′	912	3°5	107	65° 33′	10° 28′	492	—0°3	135	62° 48′	9° 48′	270	0°4
	62° 36′	26° 01′	472		108	65° 30′	12° 00′	97	1°1	136	63° 01′	9° 11′	256	4°8
	62° 36′	25° 30′	401		109	65° 29′	13° 25′	38	1°5	137	63° 14′	8° 31′	297	—0°6
84	62° 58′	25° 24′	633	4°8	110	66° 44′	11° 33′	781	—0°8	138	63° 26′	7° 56′	471	—0°6
85	63° 21′	25° 21′	170		111	67° 14′	8° 48′	860	—0°9	139	63° 36′	7° 30′	702	—0°6
86	65° 03′6	23° 47′6	76		112	67° 57′	6° 44′	1267	—1°1	140	63° 29′	6° 57′	780	—0°9
87	65° 02′3	23° 56′2	110		113	69° 31′	7° 06′	1309	—1°0	141	63° 22′	6° 58′	679	—0°6
88	64° 58′	24° 25′	76	6°9	114	70° 36′	7° 29′	773	—1°0	142	63° 07′	7° 05′	587	—0°6
89	64° 45′	27° 20′	310	8°4	115	70° 50′	8° 29′	86	0°1	143	62° 58′	7° 09′	388	—0°4
90	64° 45′	29° 06′	568	4°4	116	70° 05′	8° 26′	371	—0°4	144	62° 49′	7° 12′	276	1°6
91	64° 44′	31° 00′	1236	3°1	117	69° 13′	8° 23′	1003	—1°0					

THE DANISH INGOLF-EXPEDITION.

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