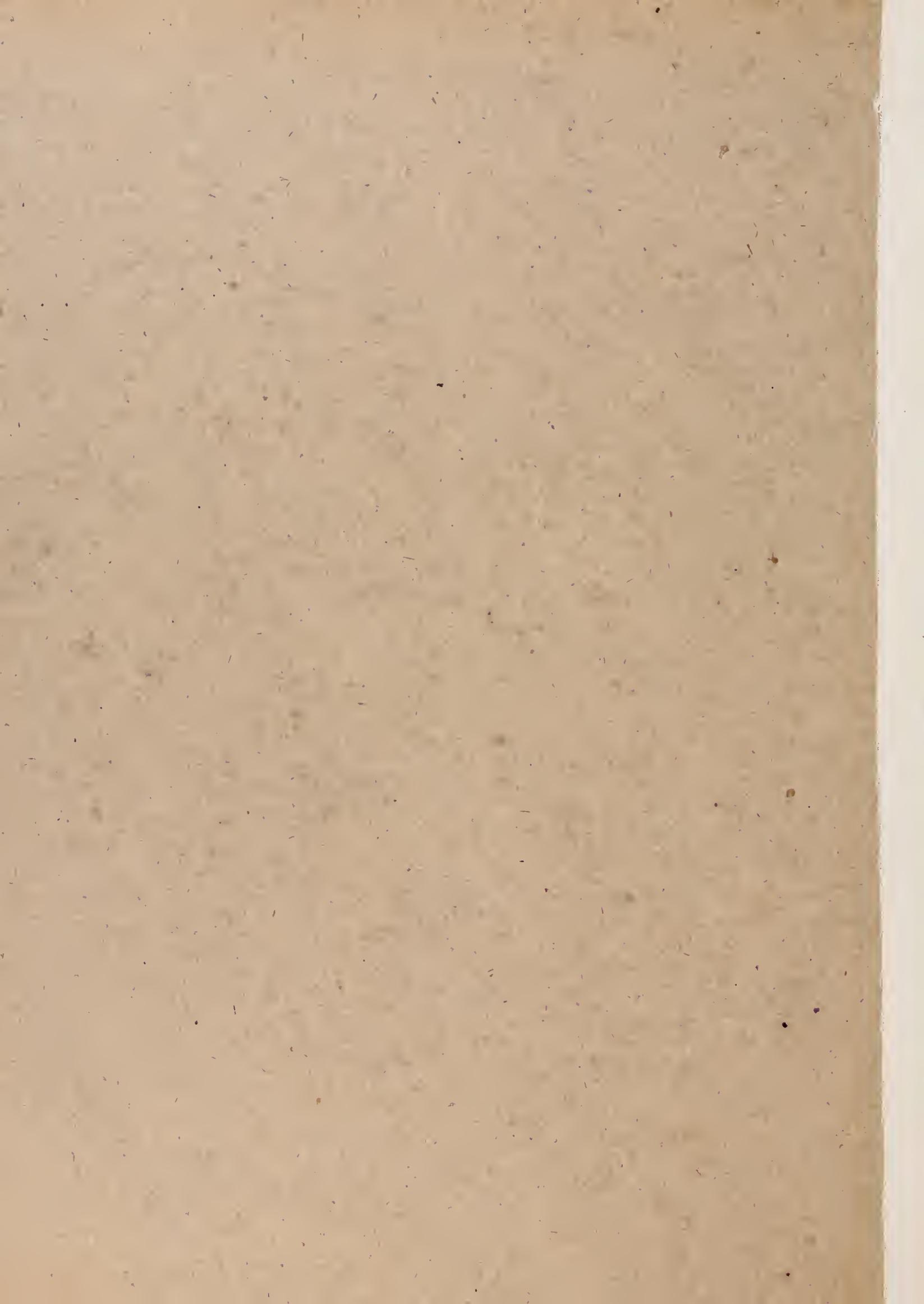


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EXPÉDITION ANTARCTIQUE BELGE

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SOUS LE COMMANDEMENT DE

A. DE GERLACHE DE GOMERY

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ZOOLOGIE

SCHIZOPODA AND CUMACEA

BY

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ANVERS

IMPRIMERIE J.-E. BUSCHMANN

REMPART DE LA PORTE DU RHIN

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SCHIZOPODA AND CUMACEA

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I. — The Order **EUPHAUSIACEA** (1)

The material comprises two adult species, one of which is new to science, a few very young or not fully developed specimens of two other species, and a number of larvæ belonging to two species. It is often difficult and not infrequently impossible to determine half-grown specimens and especially larval forms when tolerably complete series of stages are not to hand, and the difficulties become increased when the material is proportionately scanty, not containing several of the forms inhabiting the sea in question. Fortunately I am able to name nearly the whole material from the *BELGICA*, but one species represented by two larval stages remains uncertain. I describe, however, and give analytical figures of all larval stages in the collection, especially because the metamorphoses of the two species differ from one another and present features differing in a very interesting way from the development of a species of the same genus worked out by G. O. Sars in the *CHALLENGER* report.

A. — ADULT AND NEARLY HALF-GROWN SPECIMENS

I. — *Euphausia superba* Dana

IN 1906 HOLT & TATTERSALL made out that *E. superba* sensu G. O. Sars is the adult male, *E. Murrayi* G. O. S. the adult female, *E. antarctica* G. O. S. the immature form of the same species, furthermore that *E. glacialis* Hodgson and *E. australis* Hodgson are to be cancelled as synonyms to *E. superba*. I can fully confirm these statements.

OCCURRENCE. — Lat. 70° 20' S., long. 85° 52' W., about twenty specimens taken « dans une fente de la banquise antarctique, près de la surface, 27 décembre 1898 »; nearly all the specimens are moderately large, but none really full-grown. — Lat. 70° 54' S., long. 89° 18' W., about twenty specimens from the stomach of *Lobodon carcinophaga*; how common it must be is

(1) The name Schizopoda is used in the title only because it is brief and still generally used; the two orders Euphausiacea and Mysidacea are in reality far from closely related to each other.

seen from the remark : « Cette espèce fournit la nourriture presque exclusive des manchots et phoques ».

Larval stages taken near the last station are described in the sequel.

DISTRIBUTION. — *E. superba*, established in 1852, seems to live everywhere in the Antarctic Ocean, as it has been taken by every expedition touching or exploring any part of these seas.

REMARKS. — The zoologist of the *BELGICA*, Prof. EMILE G. RACOVITZA, communicated me his notes on the specimens from the first-named locality ; his observations are so interesting that they ought to be given in extenso in his own words.

« Les yeux sont noirs, les organes lumineux purpureus, le corps et les appendices transparents, incolores, laissant apercevoir l'intestin ruber ou brun foncé et le foie flavovirens. Une teinte violaceus pâle colore les jointures des pléopodes et la surface des branches des pléopodes, des uropodes et des antennules. Des chromatophores ruber sont distribués sur tout le corps de la manière suivante. Les cormopodes en ont une rangée sur la face externe, ceux des articles basilaires sont gros, tandis que ceux des longs articles distaux sont très petits. Les antennes sont couvertes de chromatophores. Le céphalothorax en a un groupe antérieur relié à un groupe postérieur par deux bandes latérales laissant le milieu de la carapace incolore. Chaque segment abdominal en a un large groupe dorsal, et une traînée bien fournie court le long de la ligne médiane ventrale. Le telson possède des chromatophores du côté dorsal.

» Ces animaux sont constamment en mouvement ; les pléopodes battent régulièrement d'avant en arrière pendant quelque temps, puis l'animal exécute quelques sauts. Les cormopodes, avec leurs longues soies hérissées de poils, agissent comme un filet pour capturer les petits animaux et surtout les diatomées. De nombreux corps cylindriques de 164 μ de diamètre et jusqu'à 5 mm. de longueur, de couleur blanche, flottent dans l'eau qui contient des *Euphausia* ; ce sont leurs fèces, formées surtout de débris de frustules de diatomées.

» Les *Euphausia* se tiennent de préférence à quelques centimètres en dessous de la surface, dans les anfractuosités des plaques de la banquise, là où les diatomées sont abondantes.

» Presque tous les exemplaires ont des infusoires parasites fixés sur les soies des pléopodes ou bien sur celles des exopodites des cormopodes. »

2. — *Euphausia longirostris* n. sp.

(Pl. I, figs. 1 a—1 c.)

The *BELGICA* obtained the anterior half of an adult specimen, but later I received several fine specimens captured by the Swedish antarctic Expedition.

E. longirostris is closely allied to *E. spinifera* G. O. Sars, but it is readily separated by the shape of the lappet of the first antennular joint. In *E. longirostris* this lappet is distally much narrower than the proximal part of the second joint and bifid, terminating in two triangular, acute, flat processes, while in *E. spinifera* the lappet is distally not narrower than the proximal part of the second joint, and its terminal transverse margin has a row of spiniform teeth.

The carapace agrees closely with that of *E. spinifera* as to the shape of the dorsal crest, the existence of a small sublateral tooth from the front margin above the eye-stalks,

the place of the lateral denticle above a small incision in the lower margin, the submarginal furrow from the insertion of the lateral denticle to the base of the antennæ, and the deep incision in the upper part of the hind margin, but the rostrum is still longer than in the last-named species, reaching nearly to the end of the antennular lappet, thus longer than in any other species of the genus (or the order).

The antennular peduncle has the characteristic lappet just described on the first joint, second joint is provided with a long, spiniform, almost horizontal process from the middle of its upper distal margin; the dorsal carina on the third joint is high.

The abdomen has the third segment armed dorsally with a long, compressed, slightly decumbent process; fourth and fifth segment each with a moderately short, spiniform unpaired process; all three segments have the upper part of their posterior margin adorned with incisions nearly as in *E. spinifera*, but the epimera of the fifth segment are less produced posteriorly than in the latter species.

A specimen from the Swedish Expedition measures 28 mm. in length.

LOCALITY. — Lat. 56° 49' S., long. 64° 30' W.; depth of the sea 3850 m., Jan. 16, 1898. The fragment was captured by the sounding apparatus.

3. — *Thysanoëssa macrura* G. O. Sars (1883)

[Pl. I, figs. 2 *a*—2 *h*

1885. *Thysanoëssa macrura* G. O. Sars, Report CHALLENGER Schizopoda, vol. XIII, p. 125, pl. XXIII, figs. 1-4.
1906. — — — HOLT & TATTERSALL, Ann. Mag. Nat. Hist., ser. 7, vol. XVII, p. 5.

To this species I refer four immature specimens; the largest specimen measures 8 mm., the smallest only 5.7 mm. in length. Figures 2 *a*—2 *f* represent parts of the large specimen, figs. 2 *g*—2 *h* parts of the small one.

The large specimen agrees moderately well with the description and the figures given by Sars, but the presence of a small spiniform process at the outer end of the distal edge of the basal antennular joint — a feature being a remnant of a larval character — shows that the animal has not quite finished the development. The upper section of the eyes is small (fig. 2 *a*); the rostrum (fig. 2 *b*) is a little shorter than in Sars' figure; the cephalothorax possesses the lateral denticle; the sixth abdominal segment is slightly shorter than the sum of the fourth and the fifth (fig. 2 *c*). Only one of the trunk-legs of the first pair is preserved, and it is unusually short (fig. 2 *d*), with the penultimate joint slightly longer than the last; the last joint is a little shorter than some of the setæ situated on its apex and its lower margin, and two of the last-named setæ are strong and sparingly ciliated. The terminal part of the telson has acquired its final shape and armature (fig. 2 *f*).

The small specimen (figs. 2 *g*—2 *h*) shows some larval characters: it is in reality in the last larval stage, but it is dealt with here for the sake of comparison. The rostrum is a little shorter than in the preceding specimen, the process from the distal margin of first antennular joint is long, the antennular flagella are short and unjointed, and the telson must be described separately. The most distal, tapering part of the telson is considerably shorter in proportion to its breadth and the movable flat spines are much narrower (fig. 2 *h*) than in the large specimen, but the most essential difference is that a slender spine, ciliated along its inner margin and as long

as the flat spine, is inserted laterally just in front of the latter, while it is absent in the following stage. The trunk-legs of first pair are long (fig. 2g), much longer than the second pair and proportionately much longer than the corresponding leg in the large specimen; in these legs the last joint is slightly more than half as long as the penultimate joint. As a parallel it may be mentioned that HOLT & TATTERSALL state that most of their specimens — from 13 to 28 mm. in length — had the first pair of legs much longer than in the specimen figured by SARS, while in two specimens these legs are only as long as in the types.

The two remaining specimens, which are respectively 7.7 mm. and 6.3 mm., have arrived at the same stage of development as the largest specimen described. In both specimens the prehensile legs are wanting.

LOCALITIES. — Lat. 70° 41' S., long. 90° 14' W., May 1, 1898, plankton VIII; one specimen. — Lat. 70° 33' S., long. 89° 22' W., May 4, 1898, plankton IX; two specimens (the types for my figures). — Lat. 70° 05' S., long. 83° 07' W., August 31, 1898, plankton; one specimen.

DISTRIBUTION. — This species is evidently widely distributed. SARS enumerates four localities more or less distant from Kerguelen, two places in the Antarctic Ocean at the ice-barrier, and a place in the South Atlantic, south of Buenos-Ayres. HOLT & TATTERSALL had numerous specimens from the DISCOVERY, they « were taken both in the open sea and through holes in the ice »; STEBBING mentions it from the Falkland Islands.

B. — SPECIMENS IN THE LAST LARVAL STAGE (1)

4. — *Euphausia crystallorophias* Holt & Tatt.

(Pl. I, figs. 3a-3c)

1906. *Euphausia crystallorophias* HOLT & TATTERSALL, ANN. MAG. NAT. HIST., ser. 7, vol. XVII, p. 3.

Three specimens are to hand, the largest measuring 10 mm., the two others 9 mm. in length, but all in the same stage of development. Mr. HOLT kindly presented me with several specimens of his *E. crystallorophias*, and the smallest of these is nearly 14 mm. A comparison with this specimen gave the result that the three specimens captured by the BELGICA belong to the same species. Mr. HOLT's young specimen has not yet lost the spiniform process on the front margin of the basal antennular joint, but the telson has obtained the shape and armature found in adult specimens. The specimens from the BELGICA have the antennular process mentioned at least as long as in Mr. HOLT's specimen, but the telson has a pair of long, slender spines inserted in front of the long, depressed, movable spines (fig. 3c). The three specimens agree with *E. crystallorophias* in the shape and relative length of the joints in the antennular peduncles, in showing no trace of lappet on the basal antennular joint, in possessing very large eyes (fig. 3a), in the shape of the rostrum, furthermore in the slenderness of the body, in the existence of a marginal tooth on the carapace, and in the relative length of the rami of the uropoda.

(1) A single specimen of *Thysanoëssa macrura*, which ought to have been dealt with under this heading, is described above together with a more developed specimen.

In my specimens the antennular flagella are extremely long, as long as the sum of the cephalothorax and the two anterior abdominal segments. The maxillipeds and four anterior pairs of legs are well developed, but the legs of fifth pair are very short, the endopod only as long as the exopod and about as long as the penultimate joint of the maxillipeds.

OCCURRENCE. — Lat. 69° 59' S., long. 82° 39' W., September 3, 1898, plankton; two specimens. — Lat. 70° 09' S., 82° 35' W., November 11, 1898, plankton; one specimen (type for the figures).

DISTRIBUTION. — This species was taken by the *DISCOVERY* through holes cut in the ice, and has not been recorded from any other expedition.

C. — SPECIMENS IN INTERMEDIATE LARVAL STAGES

Larvæ of *Euphausia superba* Dana

(Pl. I. figs. 4 a—4 m.)

From a single station a good number of specimens of the same species are to hand. The larvæ are in four stages, and it is necessary to describe each stage separately.

STAGE A (figs. 4 a—4 e). — A specimen measures 4.5 mm. from the margin of the rostrum to the tip of the telson. The carapace is without posterior dorsal process or marginal teeth. The rostrum is a very large and broad plate (fig. 4 a) with the front margin semicircular; it covers about three-fourths of the inner part of the basal antennular joint. The large eyes are not marked off from the stalk — but the preservation is not good and therefore the aspect given in fig. 4 a is only approximate. The outer part of the distal end of first antennular joint is produced into a very long process reaching to the end of third peduncular joint and armed with numerous spinules along its inner margin. The inner flagellum is considerably shorter than the third joint of the peduncle and longer than the outer flagellum; both flagella are unjointed and terminate in setæ; several plumose setæ are found along the inner side of the joints of the peduncle, especially on the third joint. The antennæ have both rami subequal in shape and length, each of them about as long as the sum of the two distal joints of the antennular peduncle and terminating in a bundle of long setæ. The mandibular palp is a small conical joint. The maxillipeds (fig. 4 b) have the endopod three-jointed, somewhat longer than the exopod but considerably shorter than the broad lamellar basal part of the appendage. Five pairs of legs are somewhat developed: the endopods are nearly sausage-shaped, not very distinctly divided into joints, terminating in a short setæ, and about twice as long as the exopods (fig. 4 c); the legs have a vestige of the branchia at the base; fifth pair are somewhat shorter than the other pairs which are subequal in length and somewhat shorter than the maxillipeds. Four pairs of pleopods are scarcely as long as the height of their segments; the exopods are marked off from the peduncles, sausage-shaped, without bristles; the endopods are still wanting. Fifth pair of pleopods scarcely visible. Sixth abdominal segment a little longer than broad (fig. 4 d). The uropoda scarcely half as long as the telson, far from reaching its lateral spines; the exopod is somewhat longer than the endopod, and both rami are furnished with long setæ. The telson (figs. 4 d and 4 e) is three and a half times longer

than sixth segment, widening from the base to near the end where it is almost twice as broad as at the base; a lateral spine is found somewhat behind the middle, and these spines have each two secondary spinules at some distance from the base. The posterior margin has its major portion straight, transverse, with seven spines; towards each side the margin bends suddenly obliquely forwards, and each oblique postero-lateral part has three spines. The seven spines have a row of fine spinules along each margin; the median spine is moderately short, while the others are gradually longer outwards, those of the fourth pair being not fully twice as long as the median spine. The three pairs of postero-lateral spines are characteristic; the inner spine is very long, a little longer than the next and nearly twice as long as the third which is almost as long as the outer pair of posterior spines described; all three pairs have at a good distance from the tip a small, conspicuous, dorsal spine, and the two long pairs have numerous spinules along the inner margin between its base and the dorsal spine mentioned, while their outer margin is glabrous; the shorter outer pair have only one or two spinules on the inner margin.

STAGE B (figs. 4 *f*—4 *h*). — The specimen drawn measures 6 mm. Cephalothorax, eyes and antennæ nearly as in stage *A*. The process on the basal antennular joint does not reach the end of the third joint; the flagella are subequal in length and a little longer than the third joint, but still unjointed (fig. 4 *f*). The mandibular palp is moderately short, nearly sausage-shaped, scarcely divided into joints and without setæ. The maxillipeds have the endopod nearly twice as long as the exopod, three-jointed. The five pairs of legs have the endopods distinctly divided into the final number of joints and are furnished with setæ; the four anterior pairs are nearly twice as long as the maxillipeds, fifth pair are a little shorter; the branchiæ are feebly developed. All pleopods have the exopods long and furnished with setæ; the endopods are small. Sixth abdominal segment (fig. 4 *g*) about half as long again as broad, the uropods slightly more than half as long as the telson, not reaching its lateral spines, and the exopod longer than the endopod. The telson is not three times longer than the sixth segment and not fully three times as long as broad, thus conspicuously narrower than in stage *A*, but the armature and relative length and breadth of its spines are nearly as in that stage.

STAGE C (fig. 4 *i*). — A specimen measures 7 mm. The rostral plate is a little narrower than before; the eyes are well marked off from the stalk. The inner antennular flagellum is slightly shorter than the outer, as long as the sum of the two distal joints of the peduncle; both flagella are indistinctly divided into joints. The rami of the antennæ are still subequal in breadth, but the exopod is a little shorter than the endopod. The mandibular palp is three-jointed, with a terminal bristle. The maxillipeds have the endopod somewhat longer than in the preceding stage, but it has not acquired its full number of joints and is much shorter than first pair of legs. The five pairs of legs look essentially as in the adults, the first pair reaching the end of the second antennular joint, the fifth pair (in which the part beyond the fourth joint is still rather short) having their end situated vertically below the posterior half of the eyes, but the branchiæ are still somewhat feebly developed. The pleopods have the endopod considerably longer than in the preceding stage, but still only half as long as the exopods. Sixth abdominal segment and telson as to shape intermediate between stage *B* and stage *D*; the uropods reach to the lateral spines of the telson, and their rami are equal in length. The telson (fig. 4 *i*) has still seven spines on the posterior margin, but they differ less from each other as to length. The three postero-lateral spines have still preserved their armature, but the inner spine has

now its proximal half depressed and very much broader than before though not fully as broad as in the next stage, and the outer spine is proportionately somewhat shorter than in earlier stages.

STAGE D (fig. 4 *k*—4 *m*). — The specimen drawn measures 7.5 mm. The rostral plate (fig. 4 *k*) is conspicuously narrower in front than in stage *A*; the eyes are well defined. The antennulæ are more developed; the process from the end of first peduncular joint does not reach the end of the third joint; the inner flagellum is considerably longer than the sum of the two distal joints of the peduncle and somewhat shorter than the outer flagellum; both flagella are divided into five to seven joints. The antennæ still nearly as in the preceding stage; the exopod a little shorter and broader than the endopod. The mandibular palp and the endopod of the maxillipeds proportionately a little longer than in stage *C*.

The trunk-legs are well developed. The pleopods are well furnished with setæ; their endopod is more than half as long as the exopods, with the secondary articulated lobe developed. Sixth abdominal segment (fig. 4 *l*) nearly twice as long as broad; its uropods reach a little beyond the lateral spines of the telson. The telson is between two and a half and two times as long as the sixth segment and a little more than three and a half times as long as broad; its posterior margin is considerably shorter than in earlier stages and has only five spines which are nearly equal in length (fig. 4 *m*); each postero-lateral margin is somewhat longer than before, its outer spine is shaped as in earlier stages but comparatively a good deal shorter, the second spine has preserved its shape and armature, while the inner spine is flattened and very broad in the proximal half, the spine being only a little more than four times as long as broad, and the spinules along the proximal half of its inner margin are lost.

The following stages are not represented in the collection. I am sure, nevertheless, that the reference of the stages described to *E. superba* is correct. A view on Sars' figures of this species and especially of the immature specimen of *E. superba* established by him as *E. antarctica* shows that especially in the fifth pair of legs the sum of the three joints beyond the vertical articulation is short in proportion to the sum of the joints before the «knee»; this proximal part of the posterior legs is in reality longer in *E. superba* in proportion to cephalothorax than in any other species of the genus, and the last larval stage just described shows the same; it may be added that the two posterior pairs of legs when directed forwards have the vertical articulation just below the eyes as in Sars' figures of *E. Murrayi* and *E. antarctica* (both synonyms to *E. superba*).

LOCALITY. — Lat. 70° 33' S., long. 89° 22' W., May 4, 1898, plankton; many specimens.

Larva of *Euphausia* sp.

(Pl. II, figs. 1 *a*—1 *f*.)

STAGE A (figs. 1 *a*—1 *c*). — Length of my single specimen 6.2 mm. According to the degree of development of telson and uropoda this specimen agrees with stage *C* of *E. superba*, but its antennæ and especially its antennulæ are much more developed while the fourth and especially the fifth pair of legs are much less developed than in that animal. The carapace has a well developed lateral denticle; the rostral plate (fig. 1 *a*) is subtriangular and rounded in front.

The antennulæ have the process of first peduncular joint very long, reaching almost to the end of the peduncle; the flagella are extremely long, measuring 2.4 mm., not fully two and a half times as long as the peduncle, subequal in length and distinctly jointed. The antennæ have the endopod more than twice as long as the exopod, sausage-shaped, unjointed; the exopod has to a certain degree acquired the final shape with setæ along the inner and the terminal margin. The mandibular palp is moderately short, feebly jointed, without bristles.

The maxillipeds and anterior pair of legs essentially as in the adults; third pair are somewhat shorter, fourth pair have the endopod only half as long as in the third pair, and the endopod of fifth pair is very short, nearly rudimentary. The pleopoda developed nearly as in stage *D* of *E. superba*. Sixth abdominal segment slender, more than twice as long as broad. Telson slender, four times as long as broad; the degree of development and armature nearly as in *E. superba* stage *C*, and small specific differences in the spines may be seen on the figures.

STAGE B (figs. 1 *d*—1 *f*). — Length of one of the two specimens 8.8 mm. The armature of the telson is less reduced than in stage *D* of *E. superba*, but in several other characters the animals are much more developed. The antennulæ have still the process from the basal joint nearly as long as the two following joints; the flagella are long, but their terminal part is lost. The antennæ have both the squama and the flagellum shaped nearly as in the adult. The mandibular palp is three-jointed, with a very long terminal seta. Fourth pair of legs still considerably shorter than second (third pair are lost), and fifth pair are nearly rudimentary. Sixth abdominal segment somewhat more than twice as long as broad (fig. 1 *e*); the uropoda reach a little beyond the lateral spines of the telson. The telson is slightly more than twice as long as the sixth segment and five times as long as broad, thus very narrow; the posterior margin is a little shorter than in stage *A* and its lateral pair of spines are somewhat reduced in size (fig. 1 *f*); the postero-lateral margins are considerably longer than in stage *A* and besides considerably concave; the inner spine has its proximal third flat and very expanded; both this spine and the next are much longer than in stage *A* while the outer spine has its former length.

Judging from many particulars I think that the two stages (three specimens) described belong to the same species, but I am not able to point out the adult species to which these larvæ belong. The length of the process of the basal antennular joint, the high development of the antennular flagella and the slenderness of the abdomen may induce one to refer them to *E. crystallorophias*, but a comparison between stage *B* and the above-mentioned animals referred to *E. crystallorophias* shows that the eyes are considerably smaller in the larvæ of stage *B* than in the last-named animals, though they differ little from each other in length, and the difference as to the eyes is so considerable that the reference to *E. crystallorophias* must be abandoned.

LOCALITIES. — Lat. 70° 41' S., long. 90° 14' W., May 1, 1898, plankton; one specimen (stage *A*). — Lat. 71° 15' S., long. 87° 27' W., May 21, 1898, plankton; two specimens (stage *B*).

D. — SOME MORPHOLOGICAL REMARKS ON THE DEVELOPMENT IN EUPHAUSIA

It is pointed out in the description of stage *A* of *Euphausia* sp. that this larva has the telson developed as stage *C* of *E. superba*, while its antennular flagella is widely more developed,

its last pair of legs much less so than in the last-named form. This shows that there is considerable difference between the development in these two species of the same genus.

In his standard work on the Euphausiacea of the CHALLENGER, G. O. SARS fills two plates (pl. XXIX and XXX) with figures illustrating the development of his *Euphausia pellucida*, and the description of the larval stages occupy nearly nine pages. He thinks that the development of the members of this order (which he regards as a family) is so uniform that he gives short diagnoses « of each of the principal stages peculiar to the development of the Euphausiidae »; these stages he names *Nauplius* stage, *Metanauplius* stage, *Calyptopis* stage, *Furcilia* stage, *Cyrtopia* stage and *Post-larval* stage; it may be added that in the description of *E. pellucida* he has three subdivisions of the *Furcilia* stage and two of the *Calyptopis* stage. And let us now take two examples for comparison between a couple of his stages and animals from the BELGICA.

In the diagnosis of the *Furcilia* stage we find (p. 150): « Anterior pairs of legs and pleopoda successively developing », and in his description of the last *Furcilia* stage of *E. pellucida* (p. 157): « In this stage all the pleopoda have become developed, and act in the living animal as true swimming organs. On the trunk the second pair of legs have become articulated, though they are still much smaller than the first, and behind it a few minute bud-like projections may be seen, apparently representing two additional pairs of legs, besides the first trace of the gills. » On pl. XXX, fig. 3 and fig. 40 represent respectively the antennula and the telson (and uropod) of the last *Furcilia* stage, and these figures agree completely with the shape of the same organs in stage *C* of *E. superba*. But in the last *Furcilia* stage even the second pair of legs are still small and the following pairs only bud-like, while in stage *C* of *E. superba* all five pairs of legs look essentially as in the adults, those of the fifth pair being so long that their end is situated vertically below the posterior half of the eyes. Consequently these larvæ of the two species differ from each other in such an important point as the development of the legs, while they agree in most other features.

In the description of his first *Cyrtopia* stage of *E. pellucida* SARS says (p. 157-158). « The character distinguishing most prominently this stage from those preceding it, is the total change in structure and function of the antennæ.... Of the two branches, the one has assumed the character of the scale, the other of the flagellum. » According to this description and his fig. 8 on pl. XXIX and fig. 7 on pl. XXX his larva agrees in this respect with stage *A* of my *Euphausia* sp., but further comparison shows that in my larva the trunk-legs are considerably more, the telson much less developed than in SARS' animal, as seen on his fig. 8 on pl. XXIX and fig. 41 on pl. XXX.

The features pointed out show that there is much difference between the development of the three species of the same genus: when a set of organs are similarly developed in larvæ of two species, other organs are either considerably more or much less developed in one of these larvæ than in the other. Therefore it may be difficult to refer several larval forms to the *Furcilia* or *Cyrtopia* stages as they are defined by SARS. But our knowledge of the development of the species of this order is still in its infancy.

II. — The Order **MYSIDACEA**

The collection contains two species. Both were new when handed over to me, but one of them has been described by E. W. L. HOLT & W. M. TATTERSALL in their « Preliminary Notice of the Schizopoda collected by H. M. S. DISCOVERY in the Antarctic Region (Ann. Mag. Nat. Hist., ser. 7, vol. XVII, 1906), and in the same paper the authors mention and name the other species, but do not describe it. Both species have received the names proposed by me; when Mr. HOLT in 1905 visited Copenhagen I showed him the figures inserted in this paper and a number of specimens of both species secured by the Swedish antarctic Expedition, and with his usual courtesy he accepted the names already chosen by me, viz. *Pseudomma Belgicæ* and *Mysis maxima*. A short time after Prof. H. COUTIÈRE worked out and published his report on the Decapoda and Schizopoda from Dr. F. CHARCOT's antarctic Expedition; he described and gave twenty figures of *Mysis maxima*, and established a new genus, *Antarctomysis*, for its reception. Fortunately the figures of this form drawn by me before COUTIÈRE's report was published will, I hope, be a useful supplement to the representation given by the able French author.

I. — **Pseudomma Belgicæ** (Hansen, MSS.), Holt & Tatt.

(Pl. II, figs. 2 a—2 c)

1906. *Pseudomma Belgicæ* HOLT & TATTERSALL, Ann. Mag. Nat. Hist., ser. 7, vol. XVII, p. 8.

From the BELGICA only a single immature female is to hand, measuring 16.5 mm. from the front margin of the ocular plate to the tip of telson; the figures are drawn from this specimen. But from the Swedish antarctic Expedition I have a very large number of specimens, and in the following I take them somewhat into consideration, but the figures illustrating some variation must be postponed to the report on the Swedish Expedition.

The species is closely allied to *P. roseum* G. O. S., *P. affine* G. O. S. and *P. Sarsii* Will.-Suhm; the main differences are found in the eye-plates, the antennal squama and the telson. The eye-plates are completely coalesced, slightly cleft in front, forming a somewhat subquadrangular laterally rounded plate which is less or more depressed at the median line, and the portion at each side of this longitudinal excavation is frequently raised towards the front margin where it in this case is produced in a feeble or very conspicuous angular protuberance; the margin of the eye-plates is otherwise completely smooth, without vestige of any serration. The antennal squama three and a half to nearly four times as long as broad; its rounded apex extends slightly or at most a little beyond the tip of the marginal spine which is well developed. The telson is sometimes not far from twice as long as broad (fig. 2 b), frequently somewhat shorter and broader at the base; its end is broadly rounded with three pairs or rather often only with two pairs of long spines⁽¹⁾ and a pair of feathery setæ; each lateral margin has sometimes five, frequently six, seven or eight spines.

(1) HOLT & TATTERSALL say that the apex has four pairs of spines, but I never found more than three pairs of long terminal spines, while a fourth pair of considerably shorter spines are inserted at the end of the lateral margin (comp. fig. 2 c).

Length of an adult male from the Swedish Expedition 27 mm., but the females are smaller, even rarely reaching the length given by HOLT & TATTERSALL, viz. 23 mm.

COLOUR. — On the colour of the specimen taken by the BELGICA the following note was made : « translucide incolore avec taches rougeâtres irrégulières. Estomac purpureus. »

LOCALITY. — Lat. 71° 19' S., long. 87° 37' W., May 28, 1898, swab ; one specimen.

DISTRIBUTION. — The specimen described by HOLT & TATTERSALL was taken at lat. 78° 25' 40' S., long. 165° 39' 6' E. — I am inclined to think that SARS has seen a specimen, which he referred to *P. Sarsii* Will.-Suhm ; he writes (CHALLENGER, p. 191) : « A single and much larger, though rather mutilated specimen, apparently of the same species was taken in the Antarctic Ocean.... lat. 65° 42' S., long. 79° 49' E.; depth 1675 fathoms. » Unfortunately this specimen seems to be lost, as I have looked for it in vain in the British Museum (Nat. Hist.).

2. — *Antarctomysis maxima* (Hansen, MSS.), Holt & Tatt.

(Pl. II. figs. 3 a-3 m)

1906. *Mysis maxima* HOLT & TATTERSALL, Ann. Mag. Nat. Hist., ser. 7, vol. XVII, p. 11.

1906. *Antarctomysis maxima* COUTIÈRE, Expéd. antarct. Française, Crust. Schizop. et Décap., p. 1, figs. 1-20.

The genus *Antarctomysis* established by Prof. COUTIÈRE is adopted here, because it is founded on structural features equivalent with those applied for subdividing into genera the large genus *Mysis* in the sense adopted by G. O. SARS in his monograph of the Norwegian Mysidæ. Gradually the suborder *Mysida* has been divided into so many often very closely allied genera, that it would be useful to undertake a revision of the classification with the intention to reduce a good number of the genera to subgenera of various main genera in order to get a better view of the natural relationships of the species and genera. The French author has given a diagnosis of the new genus.

The material from the BELGICA comprises three female specimens, two of which are large while the third is less than half-grown. The Swedish Expedition has captured a good number of both sexes of this species, and besides many specimens of an other closely allied but sharply defined species, for which I propose the name *A. Ohlinii* n. sp., in honour of Dr. A. OHLIN, the late Swedish Zoologist who wrote several useful papers on arctic and Patagonian Malacostraca and was the leading Zoologist of the Swedish antarctic Expedition. The main differences between the two gigantic species shall be pointed out here, but a more special treatment of *A. Ohlinii* and of the male of *A. maxima* must be postponed till the report of the last-named Expedition.

FEMALE OF *A. MAXIMA*. — The carapace is anteriorly somewhat produced into a moderately short, triangular, acute rostral plate, the distal part of which is somewhat concave and bent a little downwards (figs. 3 a and 3 b). The front lateral margin of the carapace is subvertical and a little concave (fig. 3 b) ; the last thoracic segment and the posterior dorsal part of the penultimate segment are left uncovered by the carapace. The eye-stalks and eyes are considerably depressed ; seen from above (fig. 3 a) the eyes look essentially outwards, occupying not only the front end but the major part of or nearly the whole outer margin of the stalk, so that the inner margin of the stalk itself is much or several times longer than its outer free margin

behind the eye. The antennal squama is shaped nearly as in *Michtheimysis mixta*, lanceolate, long and very narrow, seven times or more longer than broad, closely set with setæ along both margins; a distal short part is marked off by a transverse suture.

Left mandible (fig. 3c) has the molar process short with its end cut off obliquely and even a little concave behind (fig. 3e); the second joint of the palp is more than twice as long as broad (fig. 3d). The maxillulæ (fig. 3f) do not present any aberration worth mentioning from those in *Macromysis flexuosa*; my figure shows the constituting elements, but it may be pointed out that the basal joint itself and the major part of the second joint as situated on the upper surface are hidden when the maxillula is seen from below, and they are therefore indicated by dotted lines.

The maxillæ (fig. 3g) differ from those of *M. flexuosa* especially in the shape of the terminal joint; this joint is so much expanded inwards that it is considerably broader than long, more than half of its distal margin is nearly straight, and most of this margin is beautifully adorned with a close row of very characteristic setæ. The figure shows the constituting elements, viz. the chitinous plates and two membranous areas — the latter are marked by uniformly greyish shading — but a description is omitted, because the lettering and the explanation of the plates may be sufficient for the morphological understanding.

The maxillipeds (fig. 3h) agree closely with those of *M. flexuosa*, differing from those of *M. mixta* in various minor particulars, especially in having the lobe from the fourth joint short, while it is long in *M. mixta*. The first pair of legs (fig. 3i) are very similar to those of *M. flexuosa*.

The telson is in large specimens (fig. 3l) a little more than three times as long as broad, decreasing somewhat but not gradually in breadth from near the base to a little in front of the end, where it gradually becomes slightly broader; the incision, which occupies one-fourth of the total length, is narrow in the proximal half, narrowing strongly in its distal, feebly in the proximal half. The outer margin of the telson is armed with a very large number of small spines, the end of each distal lobe terminates in a rather small but strong spine (fig. 3m), and the margins of the incision are furnished with a nearly innumerable multitude of closely set spines which are longest not far from the terminal spine and from here decrease slightly in length behind and considerably towards the bottom of the incision. In the small specimen the telson (fig. 3k) has its distal fourth somewhat different: the outer margins of this part converge conspicuously behind, and the incision is consequently less broad at its distal end.

Length of a female with marsupium from the end of rostrum to the tip of telson 47 mm.

COLOUR. — The large specimens were « blanc translucide avec taches ruber pâle sur tout le corps; yeux noirs ». The small specimen, which measures 18 mm., was « transparent avec taches ruber ».

LOCALITIES. — Lat. 71° 09' S., long. 89° 15' W., May 11, 1898, dredge; two large specimens. — Lat. 70° 48' S., long. 91° 54' W., April 27, 1898, swab; one small specimen.

DISTRIBUTION. — HOLT & TATTERSALL mention two specimens from lat. 78° 25' 45" S., long. 165° 39' 6" E. — COUTIÈRE enumerates many stations from the area explored by the French Expedition.

REMARKS. — *A. maxima* is a little longer and more robust than *A. Ohlinii*, but the two species agree closely with each other in most structural features. I have found two good differences between them. In *A. maxima* the eye-stalks and eyes are considerably depressed, the eyes look essentially forwards, occupying not only the front end but the major part or nearly the whole outer margin of the stalk, so that the inner margin of the stalk itself is much or generally several times longer than the outer free margin behind the eye; finally, the front lateral margin of the carapace is in the main vertical, so that its lower prominent rounded angle lies scarcely behind the insertion of the eye-stalks. In *A. Ohlinii* the eye-stalks and eyes are feebly depressed: the eyes look essentially forwards, the free outer margin of the eye-stalk being about as long as the inner margin; finally, the front lateral margin of the carapace is in the main extremely oblique, so that its lower prominent rounded angle lies much behind the insertion of the eye-stalks.

III. — The Order CUMACEA

Of this order three specimens belonging to three different species were captured. But one of the specimens has the carapace very broken and besides it seems to be far from adult; for these reasons it became necessary to abandon every idea of giving a description of this form which cannot be referred to any antarctic species hitherto known. The two other specimens are described here as representatives for two species new to science.

I. — *Cyclaspis glacialis* n. sp.

(Pl. III, figs. 1 a—1 g)

The specimen is a well developed female, but having no marsupium it is not adult; it measures 10.3 mm. in length. It shows some resemblance to *C. australis* G. O. S., but differs especially in lacking the lateral carina on the carapace and the sub-dorsal pair of carinæ on the three posterior cephalothoracic and the two anterior abdominal segments.

Carapace slightly more than one-third of the total length, somewhat compressed; its vertical height is a little more than three-fourths of the length. It is dorsally keeled; in the anterior three-fifths this keel is broad and in the main rounded, but besides it has a secondary extremely narrow, low but distinct carina in the middle line (fig. 1 b); in the posterior three-fifths of the carapace the main keel is slightly developed and without secondary carina. Each half of the dorsal surface of the anterior three-fifths of the carapace is somewhat excavated, and an oblong moderately arched area occupies the submedian part of each excavation; it is the existence of this pair of excavations which produces the aspect that the anterior part of the carapace is broadly keeled. The ocular lobe is moderately broad and scarcely prominent above; eye-facets can not be perceived. The pseudorostral lobes touch one another just in front of the eye-lobe which reaches nearly to the front end. The antennal notch is shallow, moderately open; the tooth nearly acute.

First leg-bearing segment entirely concealed; second dorsally shaped as the posterior part of the carapace; third and fourth segments without any keel; fifth segment with a narrow, well developed carina.

Abdomen slightly longer than the cephalothoracic region; the five anterior segments subcylindrical with a median, well defined, narrow, rounded carina; on the sixth segment this carina is manifest in front, but slightly developed behind the middle (fig. 1*f*).

Third maxillipeds (figs. 1*c*—1*d*) have the distal part of the second joint a little narrower than its proximal portion, because the joint increases only a little in breadth from the middle to the base of the third joint; fourth joint is only twice as broad as the third and twice as broad as long; fifth joint is serrated along the inner part of the front margin and the distal part of the inner margin; sixth and seventh joints equal in length.

First pair of legs (fig. 1*e*) extend only a little beyond the pseudo-rostrum (fig. 1*a*). Second joint is somewhat longer than the sum of the five distal joints; it begins to taper in breadth at the base of the distal third of its total length. Fifth joint is much longer than the sum of the third and the fourth, it is exactly as long as the sixth, and nearly twice as long as the seventh.

The peduncle of the uropods (fig. 1*f*) is scarcely longer than two-thirds of the sixth abdominal segment and just as long as the exopod. The endopod (fig. 1*g*) tapers in an acute point and has along the middle of its inner margin about eight serrations, probably insertions for spines broken off with the exception of the last one.

The colour was noted to be: « Flavus avec taches arrondies blanches. »

LOCALITY. — Lat. 71° 14' S., long. 80° 14' W., May 12, 1898, swab; one specimen.

2. — *Campylaspis frigida* n. sp.

Pl. III, figs. 2*a*—2*n*)

The specimen is an adult female with the marsupium filled with brood; it measures 6 mm. In general aspect it is similar to *C. verrucosa* G. O. S., but it differs in several particulars and especially in the shape of fourth joint in third maxillipeds.

The carapace has the integuments so thin that it became impossible to give really good figures of the knots: when the animal is immersed the outlines of the nodiform protuberances are partly not discernible, and when it is taken out of the liquid it almost instantly collapses. The figures given convey the impression that the majority of the knots are arranged in rows and that they differ much from each other in size. In other respects the cephalothorax differs scarcely from Sars' drawings of *C. verrucosa*.

The antennulæ (figs. 2*c*—2*d*) are of moderate length; the basal joint is strongly curved, evidently shorter than the sum of the two others; the second joint is somewhat longer than the third. The outer flagellum is a little shorter than the sum of the two distal joints of the peduncle; it is divided into four joints, the first very short, the third very long and longer than the sum of the first and the second, with a very long sensory seta at the end; the fourth joint is twice as long as the first, with a couple of sensory setæ. The inner flagellum is a small oblong joint.

First maxillipeds (figs. 2*e*—2*f*) almost as in *C. verrucosa*. Second maxillipeds (figs. 2*g*—2*h*) differ from those in *C. verrucosa* especially in the shape of the penultimate joint, but this joint is similar to that in *C. horrida* G. O. S.

Third maxillipeds (fig. 2*i*) have the fourth joint shaped quite different from that met with in *C. verrucosa* and allied forms. In *C. verrucosa* the fourth joint is oblong, about twice

as long as broad, and the fifth joint is inserted about at the middle of its distal margin, but in *C. frigida* the fourth joint is triangular and so strongly expanded on the inner side that it is as broad as long, furthermore the major part of the very long distal margin is considerably concave and free, while the following joint is inserted on the most outer part of this margin. (It may be added that this fourth joint is completely alike in both maxillipeds of third pair.) The other joints of these appendages differ slightly from those in *C. verrucosa*.

First thoracic legs (fig. 2 *k*) nearly as in *C. verrucosa*, but in the latter the fourth joint is somewhat longer than the fifth, while in *C. frigida* the difference between the length of these joints is slight. — Second thoracic legs (fig. 2 *l*) nearly as in *C. verrucosa*, but the fifth joint is somewhat shorter than the seventh, while in the last-named species both joints are equally long.

Fifth abdominal segment (fig. 2 *m*) has a very conspicuous transverse impression somewhat behind the middle. The uropods (figs. 2 *m*—2 *n*) have the peduncle twice as long as the endopod; both rami are proportionately a little shorter than in *C. verrucosa*, while in other respects there is scarcely any difference between the uropods of the two species.

The colour was noted to be : « Céphalothorax isabellinus, abdomen incolore ».

LOCALITY. — Lat. 70° 48' S., long. 91° 54' W., swab, April 27, 1898; one specimen.

REMARKS. — One might think that *C. frigida* is identical with *C. verrucosa* var. *antarctica* described and figured by W. T. CALMAN in his report on the Cumacea from the National Antarctic Expedition. But in 1907 I laid my figures given here before that author who made a new preparation of the third maxillipeds of his species, and the fourth joint of these appendages presented the normal shape, thus differing widely from my species.

EXPLANATION OF THE PLATES

PLATE I

Fig. 1. — *Euphausia longirostris* n. sp.

- Fig. 1 *a*. — Cephalothorax with eye and proximal part of antennula and antenna, from the left; $\times 11/2$.
» 1 *b*. — Left antennula of the same specimen, from the outer side; $\times 17/2$.
» 1 *c*. — Major part of the peduncle of right antennula, from above; $\times 11$.

Fig. 2. — *Thysanoëssa macrura* G. O. S.

- Fig. 2 *a*. — Front part of cephalothorax with appendages of a young specimen, measuring 8 mm., from the left; $\times 21$.
» 2 *b*. — Same, from above; $\times 21$.
» 2 *c*. — Left maxilliped of the same specimen; $\times 30$.
» 2 *d*. — Left first thoracic leg of the same specimen; $\times 30$.
» 2 *e*. — Posterior part of abdomen of the same specimen; $\times 12$.
» 2 *f*. — Distal part of telson of the same specimen; $\times 50$.
» 2 *g*. — Front part of cephalothorax with appendages of a specimen in the last larval stage, measuring 5.7 mm., from the left; $\times 21$.
» 2 *h*. — Distal part of telson of the specimen shown in fig. 2 *g*, from above; $\times 50$.— To the right of the figure is shown separately the hook from the base of the inner margin of the broad movable spine.

Fig. 3. — Last larval stage of *Euphausia crystallorophias* Holt & Tatt.

- Fig. 3 *a*. — Head with appendages of a specimen measuring 10 mm. in length, from above; $\times 21$.
» 3 *b*. — Posterior part of abdomen of the same specimen, from above; $\times 16$.
» 3 *c*. — End of telson of the same specimen, from above; $\times 46$.

Fig. 4. — Four larval stages of *Euphausia superba* Dana

Figs. 4 *a*—4 *e*. — STAGE A; length 4.5 mm.

- Fig. 4 *a*. — Head with eyes and antennulæ, from above; $\times 19$.
» 4 *b*. — Left maxilliped, from below; $\times 47$.
» 4 *c*. — Left first leg, from behind; $\times 47$.
» 4 *d*. — Two last abdominal segments and right uropod, from above; $\times 20$.
» 4 *e*. — Posterior part of telson, from above; $\times 40$.

Figs. 4*f*–4*h*. — STAGE B ; length 6 mm.

Fig. 4*f*. — Left antennula, from above ; $\times 26$.

» 4*g*. — Two last abdominal segments and right uropod, from above ; $\times 20$.

» 4*h*. — Posterior part of telson, from above ; $\times 40$.

Fig. 4*i*. — STAGE C ; length 7 mm.

Fig. 4*i*. — Posterior part of telson, from above ; $\times 40$.

Figs. 4*k*–4*m*. — STAGE D ; length 7.5 mm.

Fig. 4*k*. — Head with eyes and antennulæ, from above ; $\times 19$.

» 4*l*. — Two last abdominal segments and right uropod, from above ; $\times 20$.

» 4*m*. — Posterior part of telson, from above ; $\times 40$.

PLATE II

Fig. 1. — *Two larval stages of Euphausia* sp.

Figs. 1*a*–1*c*. — STAGE A ; length 6.2 mm.

Fig. 1*a*. — Head with appendages, from above ; $\times 22$. The setæ omitted.

» 1*b*. — Two last abdominal segments with right uropod (its setæ omitted), from above ;
 $\times 16$.

» 1*c*. — Posterior part of telson, from above ; $\times 54$.

Figs. 1*d*–1*f*. — STAGE B ; length 8.8 mm.

Fig. 1*d*. — Head with appendages, from above ; $\times 22$. The setæ omitted.

» 1*e*. — Two last abdominal segments with right uropod (its setæ omitted), from above ;
 $\times 16$.

» 1*f*. — Posterior part of telson, from above ; $\times 54$.

Fig. 2. — *Pseudomma Belgica* (H. J. H.)

Fig. 2*a*. — Head with appendages, from above ; scarcely $\times 8$.

» 2*b*. — Telson, from above ; $\times 12$.

» 2*c*. — Posterior part of telson, from above ; $\times 30$.

Fig. 3. — *Antarctomysis maxima* (H. J. H.)

Fig. 3*a*. — Front part of a specimen measuring 18 mm., from above ; $\times 8$.

» 3*b*. — Front part of a large specimen measuring 46 mm., from the left ; scarcely $\times 5$.

» 3*c*. — Left mandible of a large specimen, from below ; $\times 8$.

» 3*d*. — Outline of the two proximal joints of the palp of the same mandible, from the
outer side ; $\times 8$.

» 3*e*. — Terminal part of the body of the same mandible, from below ; $\times 20$.

Fig. 3 *f.* — Left maxillula of a large specimen, from below ; $\times 14$.

The first joint itself, 1, and the major part of the second joint, 2, are indicated by dotted lines because situated on the upper side of the maxillula and therefore only visible with the light transmitted. *l'*, lobe of first joint ; 3, third joint, produced into a lobe. The membranous parts are indicated as such by a *uniformly* greyish tint.

» 3 *g.* — Left maxilla of a large specimen, from below ; $\times 14$.

1, first joint ; 2, second joint ; *l*², lobe from second joint ; 3, third joint ; *l*³, bifid lobe belonging to third joint ; 4, fourth joint ; 5, fifth joint ; *ex*, exopod.

The membranous parts are indicated as such by a *uniformly* greyish tint.

» 3 *h.* — Left maxilliped of a large specimen, from below ; $\times 8$.

» 3 *i.* — Left first leg of a large specimen, from behind ; $\times 8$.

» 3 *k.* — Posterior part of abdomen of the small specimen measuring 18 mm., from above ; $\times 21\frac{1}{2}$.

» 3 *l.* — Telson of a large specimen, from above ; $\times 7$.

» 3 *m.* — Distal part of the same telson, from above ; $\times 13$.

PLATE III

Fig. 1. — *Cyclaspis glacialis* n. sp.

Fig. 1 *a.* — The animal, from the left ; $\times 17\frac{1}{2}$.

» 1 *b.* — Cephalothorax and first abdominal segment, from above ; $\times 17\frac{1}{2}$.

» 1 *c.* — Left third maxilliped, from below ; $\times 22$.

» 1 *d.* — Distal part of the same maxilliped, from below ; $\times 42$.

» 1 *e.* — Left first leg, from below ; $\times 22$.

» 1 *f.* — Posterior part of abdomen with uropods, from above ; $\times 15$.

» 1 *g.* — Endopod of right uropod, from above ; $\times 34$.

Fig. 2. — *Camphylaspis frigida* n. sp.

Fig. 2 *a.* — Adult female, from the left ; scarcely $\times 14$. Most of the appendages and the marsupium omitted.

» 2 *b.* — Carapace, from above ; scarcely $\times 14$.

» 2 *c.* — Left antennula, from below ; $\times 50$.

» 2 *d.* — Distal end of the peduncle with both flagella of the same antennula, from below ; $\times 125$. The sensory hairs of the outer flagellum omitted.

» 2 *e.* — Left first maxilliped, from below ; $\times 30$.

» 2 *f.* — Distal half of first maxilliped, from below ; $\times 54$.

» 2 *g.* — Left second maxilliped, from below ; $\times 30$.

» 2 *h.* — Distal half of second maxilliped, from below ; $\times 52$.

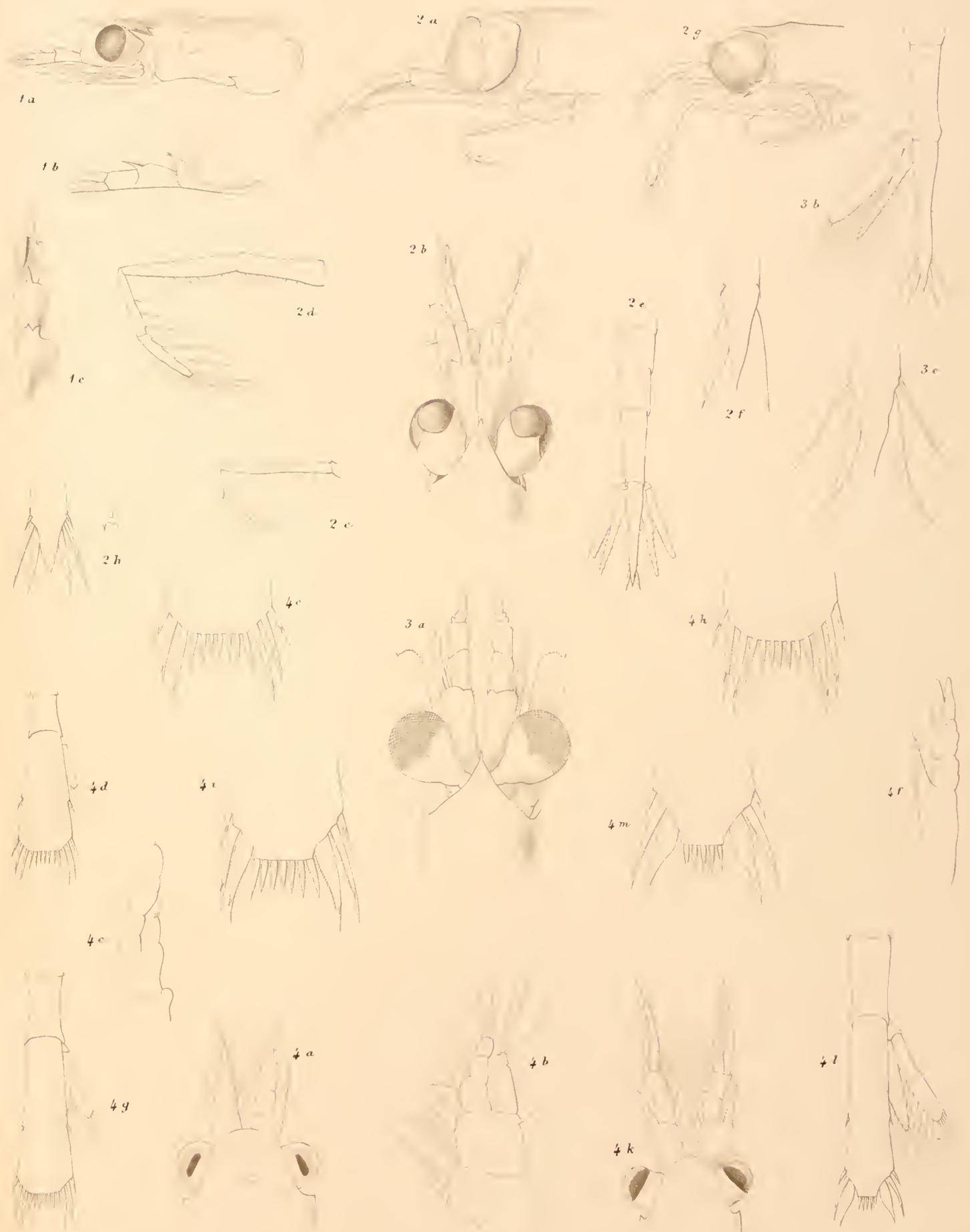
» 2 *i.* — Left third maxilliped, from below ; $\times 30$. *m*, basal part of the marsupial plate.

» 2 *k.* — Left first leg, from below ; $\times 30$. *m*, marsupial plate.

» 2 *l.* — Left second leg, from below ; $\times 30$. *m*, marsupial plate.

» 2 *m.* — Posterior part of abdomen with uropoda, from above ; $\times 19$.

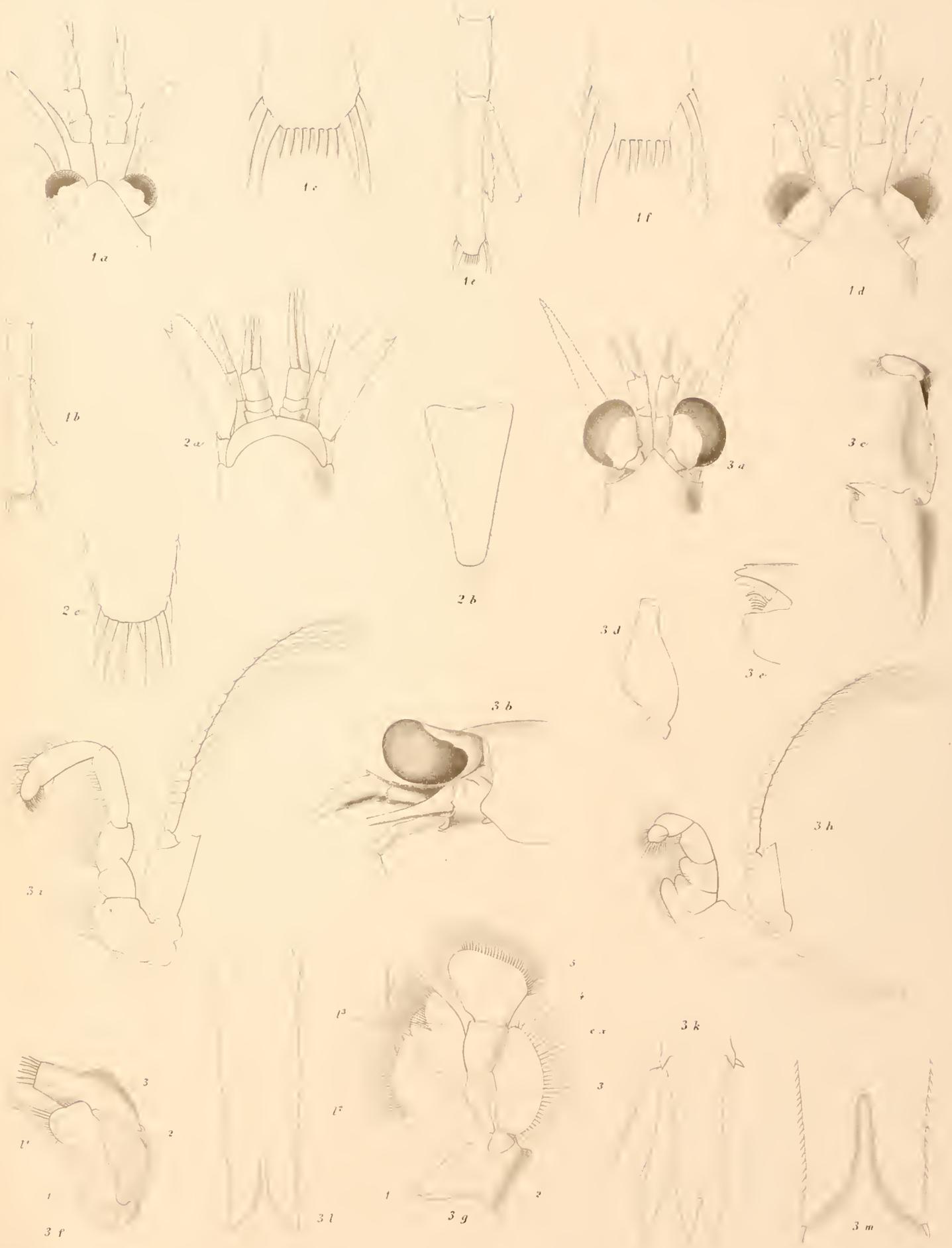
» 2 *n.* — Distal part of left uropod, from above ; $\times 41$.



H. J. Hansen del.

T. N. Møller sc.

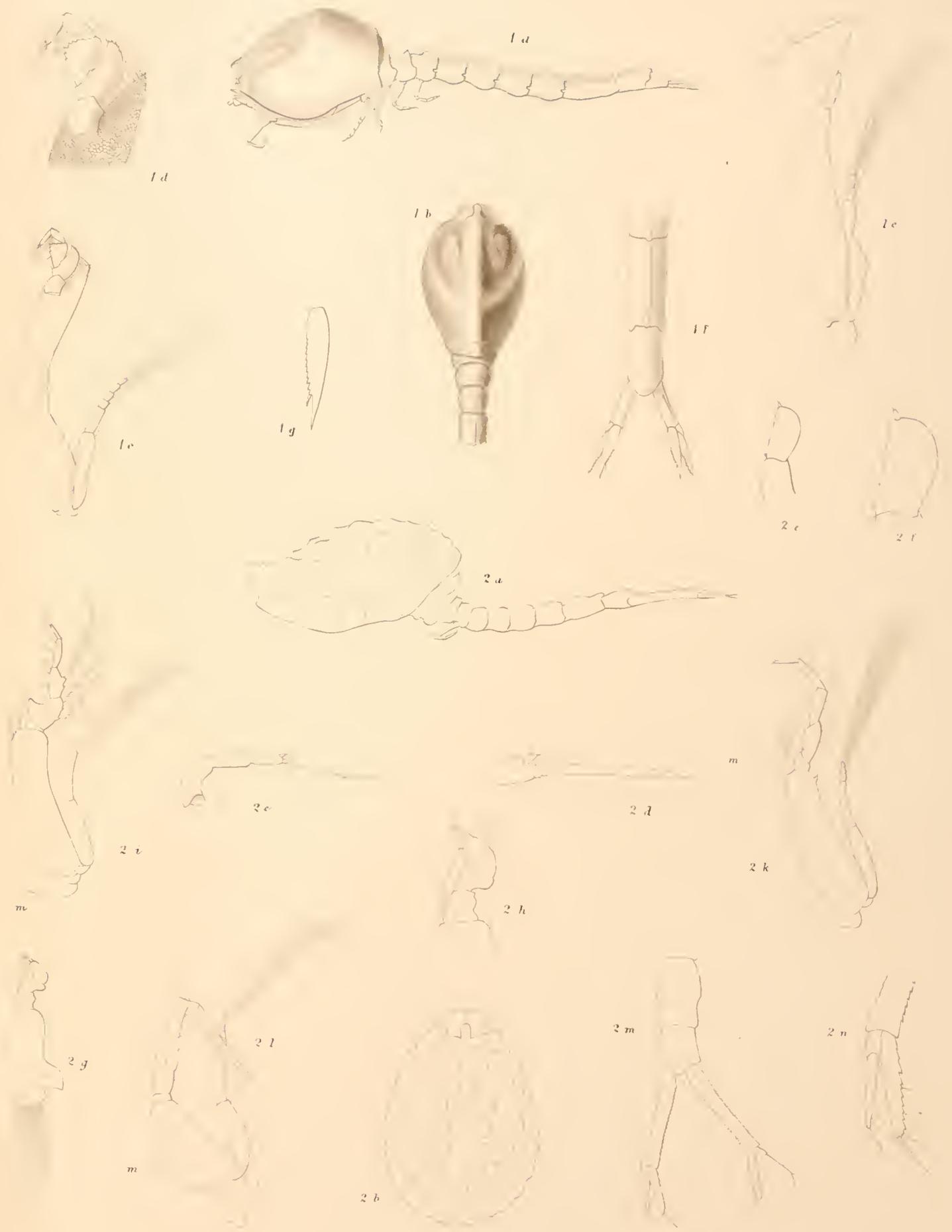
Fig. 1. *Euphausia longirostris* n. sp. Fig. 2. *Thysanoëssa macrura* G. O. S.
 Fig. 3. *Euphausia crystallorophias* Holt et Tatt. Fig. 4. *Euphausia superba* Dana



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Fig 1. *Euphausia* sp. Fig 2. *Pseudomma Belgicae* (H.J.H.) Fig 3. *Antarctomyia maxima* (H.J.H.)



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Fig. 1. *Cyclaspis glacialis* n.sp. Fig. 2. *Campylaspis frigida* n.sp.

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