PLATYCOPIA PERPLEXA

N. GEN. AND SP.

A REMARKABLE NEW TYPE OF

DEEP-WATER CALANOIDA

FROM THE NORWEGIAN COAST

BY

G. O. SARS

1911

WITH 2 AUTOGRAPHIC PLATES

ALB. CAMMERMEYERS FORLAG

Morten Johansens bogtrykkeri. — Kristiania 1911.

en avant de l'échancrure un lobe saillant de forme obtusement triangulaire, partie frontale étroitement arrondie et montrant en bas, une proéminence rostriforme portant au bout deux filaments délicats. Lobes latéraux du dernier segment du métasome légèrement anguleux au bout. Queue plus courte que chez l'espèce typique, dépassant à peine en longueur un tiers de la division antérieure, segment génital un peu symétrique et assez élargi par devant, formant en bas une protubérance bien distincte. Pièces furcales aplaties et nettement symétriques, celle de gauche, la plus grande, est obliquement tronquée au bout, soies de longueur médiocre. Antennes antérieures plus allongées que chez l'espèce typique et moins inégales, celle de gauche atteignant la longueur de la division antérieure.

Stn. 873 (un seul exemplaire).

62. **Candacia obtusa**, G. O. Sars, n. sp.

Taille ♀ : 3mm 50.

Voisine de *C. longimana*, mais s'en distingue nettement par la forme très différente des lobes latéraux du dernier segment du métasome, qui ne sont pas saillants en dehors mais simplement arrondis au bout. Maxillipèdes antérieurs très fortement développés et encore plus allongés que chez l'espèce susnommée. Pattes de la 5e paire d'une structure un peu différente de celle de *C. longimana*, ayant l'article terminal plus étroit et muni de quatre denticules, dont deux sont attachés au bord externe et deux au bout; denticule apical interne beaucoup plus long que les autres.

Stn. 1639, 1851.

VIII. — BATHYPONTIA, G. O. Sars, n. gen.

Genre assez anormal, placé tout provisoirement dans la famille *Parapontellidæ*, à cause de la structure des maxillipèdes antérieurs, qui montrent une certaine ressemblance avec celle du genre *Parapontella*.

63. **Bathypontia elongata**, G. O. Sars, n. sp.

Taille ♀ : *ca.* 5mm.

Corps considérablement allongé, avec la division antérieure très peu élargie et de forme presque cylindrique. Tête faiblement définie en arrière et dépassant à peine la demi longueur du métasome ; partie frontale arrondie et se terminant par un petit rostre simple courbé en bas. Segment dernier du métasome bien défini du précédent et ayant les lobes latéraux légèrement bilobés et très peu saillants en dehors. Queue assez grêle, atteignant en longueur un tiers de la division antérieure, et composée de quatre segments bien définis, dont le premier (génital) est assez court et peu bombé en dessous. Pièces furcales très petites. Antennes antérieures dépassant à peine en longueur la division antérieure et composées de 25 articles bien définis. Antennes postérieures avec les deux rames de longueur égale, l'externe 8-articulée. Mandibules ayant la partie masticatoire assez élargie et fortement dentelée au bout, palpe tout à fait normal. Maxilles avec toutes les parties distinctement définies, partie endopodale cependant peu développée et ne portant qu'une seule soie. Maxillipèdes antérieurs très forts, rappelant en structure ceux du genre *Parapontella*, épines extérieures assez allongées et courbées en forme de crochet. Maxillipèdes postérieurs beaucoup plus grêles et assez dissemblables de ceux du genre susnommé, rappelant plus la structure trouvée chez le genre *Candacia*. Rame interne des pattes de la première paire bi-articulée, celle des trois paires suivantes distinctement tri-articulée, avec l'article premier très court. Pattes de la cinquième paire très petites et simples, tri-articulées, avec l'article terminal étroit et portant au bout un petit denticule et une soie allongée.

Stn. 1549, 1639, 1797, 1849.

PLATYCOPIA PERPLEXA, N. GEN. AND SP. A REMARKABLE NEW TYPE OF DEEP-WATER CALANOIDA FROM THE NORWEGIAN COAST

BY

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WITH 2 AUTOGRAPHIC PLATES.

INTRODUCTION.

During my stay last summer (1910) off the southern shores of our country, most of the time was spent at Korshavn, a fishing-village located in the immediate neigbourhood of Lindesnæs, the southern-most point of Norway. I here succeeded in detecting a locality which proved extremely interesting as regards the small Crustacea belonging to the order *Copepoda*, which at that time formed the chief object of my study. The locality consisted in a submarine bank extending across the Fjord outside Korshavn, and covered with coarse sand, in some places intermingled with a slight muddy deposit. The average depth of this bank was from 30 to 50 fathoms, and the exclusive deep-water character of the bottom-fauna was thereby ascertained. It was not difficult, by the aid of a light dredge or more properly a kind of tow-net held to the bottom by a heavy lead, to obtain sufficient quantities of the bottom-material. These at first sight looked rather unpromising; but after the rough material had been carefully sifted and the sifted residue introduced into bottles with fresh sea-water, a number of small Crustacea were soon observed emerging from the deposit, most of them belonging to the extensive group *Harpacticoida* and more or less conspicuously differing from the usual littoral and sub-littoral species. Some

of these were at once subjected to a closer examination; but many others where subsequently picked up from the preserved samples, which I brought home from my expedition. A rich harvest of interesting forms was hereby made, some of them having previously been observed only in quite isolated specimens, many others being wholly unknown to me. The latter will be described and figured in the supplement to the 5th Volume of my work on the Crustacea of Norway now in progress of publication. In addition to the Harpacticoida, also some *Cyclopoida* and *Calanoida* were found, and among the latter was the remarkable form, which will be the subject of the present paper.

Platycopia perplexa, G. O. Sars.

n. gen. and sp.

In the following pages I propose at first to give a detailed description of both sexes, and then to enter into a discussion about the systematic position of this peculiar form and its relation to other known Calanoida.

Description of the Female.

The length of fully adult specimens amounts to 0,90 mm.

The general form of the body (see Pl. I, figs. 1 & 2) is comparatively short and compact, rather much resembling that in the species of the genus *Pseudocyclopia* Scott. As in that genus, the anterior division of the body appears rather broad, though somewhat compressed, and very sharply marked off from the posterior. Seen dorsally (fig. 1), it exhibits an oblong elliptical form, with the greatest width scarcely exceeding half the length and the lateral contours only very slightly curved. The anterior extremity appears broadly rounded, the posterior deeply emarginated in the middle. Seen laterally (fig. 2), this division exhibits an irregular oval form, the height being somewhat greater than the width, and the dorsal contour considerably more curved than the ventral. The 1st, or cephalic segment is very large, occupying more than $^3/_4$ of the anterior division. Its dorsal edge is evenly curved and is continued in front to

a well-marked acutely triangular rostrum curving downwards between the bases of the anterior antennæ (see also figs. 4 and 5). The infero-lateral edges of this segment form each in front a somewhat projecting broad lobe, obtusely trunated at the end and covering laterally the bases of the posterior antennæ, the mandibles and the maxillæ. Behind these lobes about in the middle between the insertions of the posterior maxillipeds and the 1st pair of legs, a well-marked suture extends upwards on each side from the edge, indicating an imperfect separation of the 1st pedigerous segment from the cephalosome. These sutures are however not visible in the dorsal aspect of the animal (fig. 1). The 4 succeeding segments are all well defined and rather short, but have the epimeral plates distinctly developed and broadest on the anterior segment (see fig. 2). The last segment, as above mentioned, is deeply emarginated in the middle, and has the lateral lobes narrowly rounded at the end.

The posterior division of the body, or the urosome, is comparatively poorly developed, not nearly attaining half the length of the anterior division, and is of narrow cylindrical form. It is very movably articulated to the anterior division, issuing from the bottom of the deep hind sinus of that division, and extending more or less upwards. Between the two divisions an imperfect segment is intercalated, the dorsal part of which only is developed (see Pl. I, fig. 2, Pl. II, fig. 8). The urosome itself is composed of 4 well-defined segments, the 1st of which, the genital segment, does not distinguish itself from the succeeding one either in size or shape. The 3rd segment is somewhat larger, whereas the 4th, or anal segment, is smaller than any of the other 3. From the dorsal face of this last segment a thin lamella divided into 2 acute lappets extends backwards partly covering the anal orifice (see Pl. II, fig.8).

The caudal rami (ibid.) are somewhat flattened and a little longer than they are broad, extending straight behind. From their end, both dorsally and ventrally, a very thin triangular lappet issues, best seen in the lateral aspect of the animal (Pl. I, fig. 2). On the outer edge of each ramus, near the base, a thin bristle is attached, and from the transversely truncated end 4 setæ of unequal length issue, each exhibiting at the base a short joint. Of these setæ the innermost but one is the longest, the

outermost the shortest. All 4 setæ are very finely ciliated in their outer part.

Of eye not the slightest trace could be detected in the preserved specimens, and I have all reason to belive, that it in reality is wholly absent, such as is the case in several other deep-water Calanoida.

The anterior antennæ (Pl. I, fig. 6) are comparatively short, only slightly exceeding half the length of the cephalic segment, and are rather thick at the base, but rapidly tapering distally. In spite of their shortness, they are composed of a rather great number of joints, viz. 23 in all. Of these joints the 1st is very largely developed, almost occupying $^1/_3$ of the length of the whole antenna. At the anterior edge of this joint, in some distance from the end, a remarkable large and thick setiform appendage is attached, curving outwards along-side the antenna and terminating in a thin bristle. The remaining joints are only clothed with small bristles, some of which are very delicate and sensory in character. Most of these joints are very short, but sharply defined. The last joint is however somewhat more elongate and of narrow linear shape, carrying on the tip a few short bristles.

The posterior antennæ (fig. 7) are very strongly built, representing powerful swimming organs. The basal part is thick and massive, indistinctly biarticulate, and terminating in an angular corner. The inner ramus, which forms the immediate continuation of the basal part, is comparatively short and, as usual, composed of 2 joints forming with each other a geniculate bend. The proximal joint is somewhat compressed, broad at the base, but rapidly tapered towards the end, and, like the basal part, is quite devoid of setæ. The distal joint is very small, lamelliform, and very movably articulated to the proximal one. It is fringed with 8 slender spreading setæ, 2 of which are attached, at some distance from the others, to a ledge of the anterior edge. The outer ramus is much larger than the inner and unusually thick and muscular. It is very flexible and composed of 6 rather irregular joints, the 6 anterior of which carry each outside a slender plumose seta. The last joint has on the tip 3 similar setæ.

The mandibles (fig. 8) are not particularly strong, their bodies being of comparatively small size. The masticatory part is abruptly incurved and only slightly expanded distally, with the cutting edge divided into a limited number of simple teeth, the outermost of which, as usual, is the largest. The palp is comparatively slender, with the basal joint oblong in shape and quite devoid of setæ. The inner ramus is very small and only consists of a single joint similar to the terminal joint of the inner ramus of the posterior antennæ. The joint carries on the tip 6 spreading setæ. The very mobile outer ramus is considerably larger, oval fusiform in shape and divided into 2 well-defined joints. It carries 5 curved ciliated setæ, 3 of which issue from the distal joint.

The anterior lip (fig. 9) exhibits a somewhet unusual shape, its middle lobe being considerably produced and clothed on its narrowly rounded tip with a bunch of long diverging cilia.

The maxillæ (fig. 10) also look rather different from those in most other Calanoida, their structure more resembling that generally found in the Harpacticoida. The masticatory lobe is largely developed and oval in form, being armed with 5 very strong, partly denticulated claw-like spines accompanied by a few ciliated setæ, 2 of which, as is the case in most Harpacticoida, issue close together from the anterior face. The palp exhibits inside a small setiferous accessory lobe and is continued in a narrow, slightly curved piece carrying on the tip 3 slender setæ. Outside this piece there is a well-developed exopodal lobe extending along-side it and reaching about to its end. This lobe is fringed with 6 setæ of somewhat unequal length, 2 issuing from the tip, the other 4 from a slight expansion of the outer edge. Of the epipodal lobe only a small rudiment is present in the form of a knob-like prominence carrying 2 comparatively short diverging setæ.

The anterior maxillipeds (fig. 11) somewhat resemble in structure those in the genus *Cyclops*. They are each composed of a large flattened basal part and a short terminal part, both very movably connected with each other. The basal part does not exhibit any trace of a subdivision, but projects inside into 4 setiferous lobes, the 2 middle of which however are rather

small and merely represented by slight expansions of the inner edge. The outermost lobe, issuing from the bottom of the sinus between the basal and terminal parts, is rather narrow and carries on the tip 3 partly ciliated setæ of moderate length. The innermost lobe is considerably larger and rather prominent, oval in form and well defined at the base. It carries 4 setæ, the innermost rather elongate and curved upwards. Of the 2 middle lobes the distal one carries 2, the proximal one only a single seta. The 1st joint of the terminal part is produced inside to a well-marked securiform lobe armed with 2 strong unguiform spines accompanied by an ordinary seta. It is followed by 2 or 3 very small joints, which are also armed with unguiform incurved spines.

The posterior maxillipeds (fig. 12) more resemble in structure those in other Calanoida, being rather slender, with the basal part divided into 2 sharply defined segments, the 1st of which carries inside on a slight expansion 2 juxstaposed ciliated setæ. The 2nd basal joint is larger than the 1st and somewhat fusiform in outline. It has inside, about in the middle, a comparatively short ciliated seta and at the end another still smaller seta; between both a very conspicuous angular incision of the edge is seen. The terminal part is narrow cylindric in form, slightly tapered and very flexible. It is about half as long as the 2nd basal joint and is divided into 5 well-defined joints, the last of which is the longest. Each joint is provided with a slender evenly curved spine accompanied by a few smaller setæ.

Between the bases of these appendages the ventral face of the body projects in a peculiar tuberculiform process (fig. 13) divided at the end into 6 obtuse denticles.

The legs exhibit a very anomalous structure, unlike that in any other known Calanoid. They all are natatory, but the 1st pair conspicuously differ both in size and structure from the other 4 pairs.

The 1st pair of legs (Pl. II, fig. 1) are much smaller than the others and are attached at some distance from them to the hind part of the cephalic segment (see Pl. I, fig. 2). They are each composed of a broad flattened basal part and 2 comparatively short rami. The basal part is divided into 2 very sharply

defined segments, the 2nd of which is the broader and carries at the end, near the inner corner, a thin deflexed spine; otherwise these segments are quite unarmed. The rami are much shorter than the basal part and both only composed of 2 joints. The outer ramus is conspicuously constricted at the base and gradually widening distally, with the 1st joint unarmed and triangular in shape, the 2nd much larger and lamellar, carrying 6 ciliated setæ, 3 at the obtusely truncated end and 3 on the inner edge. The inner ramus is a little shorter than the outer, but distinctly broader, oval in form, and pronouncedly lamellar throughout. Its 2 joints are firmly connected along a somewhat curved suture, the 1st unarmed and almost semilunar in shape, the 2nd somewhat larger and carrying 3 setæ, 2 at the tip and 1 at the inner edge.

The 4 succeeding pairs (figs. 2—5) are all built on a common type and are exceedingly powerful, though somewhat diminishing in size behind. The basal part consists of 2 firmly connected segments, the 2nd of which is the larger and somewhat widens distally, being armed outside, near the end, with a short spine, inside with a thickish seta fringed on both edges with unusually long cilia. On the last pair however this seta is wanting. The rami are both 3-articulate and somewhat incurved, but of unequal size, the outer one being much the larger. In both rami the joints are highly chitinised and unusually broad and flattened, exhibiting a coarse armature of spines, which especially outside the outer ramus are very strong. On the 1st joint of this ramus there are 2 such spines succeeding each other and attached to well-developed ledges, a quite unique feature not found in any other Copepod known to me. The last joint of each ramus is much larger than the 2 preceding ones, that of the outer ramus is in all 4 pairs armed outside with 3 spines and has at the apex another similar spine. The natatory setæ are on both rami poorly developed and partly transformed to short flattened spines.

On a closer comparison of these 4 pairs of legs, some slight differences will be found, as regards the number and shape of the spines and setæ.

On the 2nd pair of legs (fig. 2) the spines of the outer ramus are very coarse and apparently simple, though, on apply-

ing high magnifying powers, a very thin hyaline rim may be detected on each side of them. Inside the apical spine 2 comparatively short ciliated setæ occur, one of them attached at some distance from the tip to the inner edge. On the other hand, no such setæ are found on either of the 2 preceding joints. The inner ramus has the first 2 joints, as in the other pairs, short and broad, almost scale-like, with the outer corners produced to curved processes. Inside the 1st joint is a well-developed, though comparatively short ciliated seta, whereas the 2nd joint is quite unarmed. The last joint somewhat exceeds in length the other 2 combined and is slightly narrowed distally. It has outside 2 successive spines, at the tip a similar spine and a somewhat longer ciliated seta, and inside 2 spiniform setæ.

In the 3rd pair of legs (fig. 3) all the spines of the outer ramus have assumed a pronouncedly bayonet-shaped appearance, being fringed on each side with a broad hyaline border finely serrate on the edge. The 2 setæ attached inside the apical spine are transformed to flattened, lancet-like spines finely ciliated at the edges. Inside the 1st joint a well-developed, though small seta occurs, whereas the 2nd joint has no such seta. On the inner ramus the middle joint has acquired a lancet-shaped spine inside. The last joint has 7 similar spines, 2 outside, 2 at the tip, and 3 inside.

The 4th pair of legs (fig. 4) only differ from the preceding pair by the presence of a lancet-shaped spine inside the middle joint of the outer ramus, and by the want of one of the spines inside the terminal joint of the inner ramus.

The 5th or last pair of legs (fig. 5), which in most other Calanoida are much reduced, exhibit in the present form a structure very similar to that in the preceding pairs, being, as these, biramous and natatory. The differences noted in the following pages are indeed very slight and only perceivable by a very close comparison. On the outer ramus all the spines are pronouncedly bayonet-shaped, and the 1st joint has lost the seta attached inside it in the 2 preceding pairs. The inner ramus is scarcely more than half as long as the outer, but, as in the preceding pairs, distinctly 3-articulate. Its last joint has only 5 spines, 1 outside, 2 at the tip, and 2 inside, and the 1st joint

has lost its seta. As above noted, this pair also differs from the 3 preceding ones in the absence of the ciliated seta inside the 2nd basal joint.

Description of the adult Male.

As usual, the size of the male is somewhat inferior to that of the female, the length of the body scarcely exceeding 0,80 mm.

The general form of the body (see Pl. I, fig. 3) resembles that in the female, though being perhaps not fully so robust. The anterior division appears less vaulted dorsally, and the urosome is comparatively more slender. On the other hand this last division does not differ from that in the female either in the shape or number of the segments, a feature by which the present Calanoid distinguishes itself from all other known forms.

The anterior antennæ (Pl. II, fig. 6) at the first sight look very similar to those in the female, none of them exhibiting the slightest trace of a geniculation. On a closer examination, however, the number of articulations in both antennæ is found to be somewhat reduced, only 16 being counted in each. Moreover, the sensory setæ, which in the female are very small, are greatly elongated, forming very delicate band-like appendages extending far beyond the usual bristles.

The posterior antennæ, oral parts, and the 4 anterior pairs of legs are exactly of same structure as in the female.

The last pair of legs (fig. 3), on the other hand, are conspicuously transformed, though far less so than in most other Calanoida. They are comparatively larger than in the female, exceeding in size the next preceding pair. The transformation chiefly concerns the outer ramus, which, though rather elongate, is only composed of 2 joints, the outer 2 being wholly coalesced, forming together a somewhat irregular piece of narrow oblong shape. Outside, at the base, this joint forms a projecting ledge, to which a bayonet-shaped spine is attached, and beyond this ledge the joint abruptly contracts, its outer part being rather narrow, though slightly widening distally. At the outer edge of this part a single spine coarsely serrate on the one side is attached. The tip of the joint appears rather complex, several thin curved lappets extending from it and partly enveloping a spine with very broad hyaline rims. Just inside this spine a

slender styliform appendage is attached, nearly attaining the length of the whole ramus. The inner ramus is distinctly 3-articulate and resembles in structure that in the female, though being comparatively less broad. The outer edge of the last joint and partly also that of the middle one, is densely clothed with stiff hairs. No essential difference in the structure of the right and left leg is to be detected, and this is annother peculiarity of the present form, whereby it differs from all hitherto known Calanoida.

As all the specimens of the present Calanoid were only picked up from the preserved samples after my return, nothing can be communicated about the *colour* of the animal, when alive. The preserved specimens exhibit a slight yellowish tinge.

The inner organisation would seem on the whole to agree pretty well with that in other forms of the present group. It is not difficult to trace through the walls of the body the dilated anterior portion of the intestine, as also in the female (see P. I, figs. 1 and 2) the ovarial tubes extending along-side the intestine. A double row of particularly large ovarial cells appear moreover very distinctly within the hind part of the anterior division, located somewhat more dorsally.

General Remarks.

It appears to be a matter of no small difficulty to assign to the above described Calanoid its proper systematic place, as characters apparently distinguishing widely different groups are here in a perplexing manner combined. According to the structure of the anterior antennæ in the male, the present form ought evidently to be referred to the section *Amphascandria*, as defined by Dr. Giesbrecht. But in this section there is only a single family in which the last pair of legs are natatory like the preceding pairs, viz., that of the *Calanidæ*, to which the present form does not otherwise exhibit any closer affinity; in all the other families of the Amphascandria the last pair of legs are in the female either very much reduced or wholly wanting. In all the known forms belonging to the 2nd section, the *Isokerandria*, this pair of legs exhibit a similar reduction in the female. On the other hand, in the 3rd section, the *Heterarthrandria*, there are at least 4 families, in which this pair of legs in

the female are biramous and natatory, viz., the *Centropagidæ*, *Heterorhabdidæ*, *Augaptilidæ* and *Pseudocyclopidæ*. Now, it is evident, that the present genus cannot be included in the family *Calanidæ*, differing, as it does, very essentially both in the general appearance and in most of the structural details from the genera referred to that family. Nor can it of course be referred to any of the above-mentioned families, which belong to a quite different section of the Calanoida. The natatory character of the last pair of legs makes it as impossible to refer it to any of the other known Calanoid families, and it thus becomes necessary to establish for its reception a new family of the *Amphascandria*. The perplexing resemblance, which the present form shows in the external appearance and partly also in the short and stout anterior antennæ to some other anomalous genera, especially *Pseudocyclopia* Scott, *Paramisophria* Scott and *Pseudocyclops* Brady, must be accounted for as the result of a convergent evolution caused by the adaptation to similar conditions of life. The species of all these 4 genera are namely, unlike what is generally the case with the Calanoida, true bottom-forms, keeping themselves constantly close to the ground, over which they move in a peculiar gyrating manner. For such a life a short and compact form of the body, as also a reduction in length of the anterior antennæ combined with some other peculiarities may have been serviceable, and these features therefore have gradually developed in the said forms. Though, as noted above, there is a general resemblance, as to the external appearance, between the 4 genera here mentioned, their consanguinity is in reality very remote, as proved by the great differences in the structure of the several appendages, and indeed they not only belong to as many separate families, but even to 3 different sections of the Calanoida: the genus *Platycopia* to the *Amphascandria*, the genus *Pseudocyclopia* to the *Isokerandria*, and the genera *Paramisophria* and *Pseudocyclops* both to the *Heterarthrandria*. All these 4 genera more or less conspicuously deviate from the usual Calanoid type and in some respects approach that of the *Cyclopoida*, a feature which also has given rise to the generic name of 2 of these genera. The most anomalous of them is unquestionably the present genus, which, as stated above, exhibits some features, which must be regarded

as quite unique, for instance: the quite similar segmentation of the urosome in the two sexes, the peculiar armature of the 1st joint of the outer ramus in the 4 posterior pairs of legs, finally the equal transformation of the right and left leg of the last pair in the male.

DIAGNOSTIC CHARACTERS OF FAMILY AND GENUS.

Section: **Amphascandria.**

FAM. PLATYCOPIIDÆ.

Body short and compact. Cephalosome confluent with the 1st pedigerous segment and produced in front to an acute deflexed rostrum. Last 2 segments of metasome well defined. Urosome in both sexes composed of 4 segments. Anterior antennæ short and stout, though composed of rather a great number of articulations, and only sligthly differing in the two sexes. Posterior antennæ with the outer ramus much larger than the inner. Oral parts considerably deviating in structure from the usual Calanoid type. 1st pair of legs rather unlike the succeeding ones, with both rami imperfectly developed; the remaining pairs very strongly built with the rami broad and flattened. Last pair of legs in female natatory, like the preceding ones, in male transformed in the very same manner on right and left side.

Gen. Platycopia, G. O. Sars.

Anterior division of body somewhat compressed and strongly vaulted dorsally, posterior very narrow, cylindrical in form. Cephalic segment large, with a slight suture on each side, indicating its original composition of 2 segments. Lateral lobes of last pedigerous segment rounded at the tip. Genital segment short, alike in both sexes. Caudal setæ 4 in number on each ramus. Anterior antennæ composed in female of 23, in male of 16 articulations, the 1st very large and carrying in front a peculiar setiform appendage. Posterior antennæ with the inner ramus comparatively short and simple in structure, outer very powerful, 6-articulate. Anterior lip narrowly produced in the middle. Mandibles with the masticatory part only slightly expanded, palp comparatively slender, with the inner ramus small,

uniarticulate. Maxillæ with the masticatory lobe coarsely built, palp comparatively less fully developed than in most other Calanoida. Anterior maxillipeds cyclopoid in structure, the outer joints being armed with coarse unguiform spines. Posterior maxillipeds more resembling those in other Calanoids. 1st pair of legs much smaller than the others, with both rami short and biarticulate, not spiniferous. The succeeding pairs very powerful, with both rami distinctly 3-articulate, the outer one the larger and armed outside with coarse spines, 2 of which are attached to the 1st joint; natatory setæ for the most part converted to short flattened spines. Last pair of legs in female built on the very same type as the preceding ones; those in male having the outer ramus conspicuously transformed, biarticulate, with the distal joint elongate, terminating in several thin curled lappets, and carrying on the tip a slender styliform appendage.

EXPLANATION OF THE PLATES.

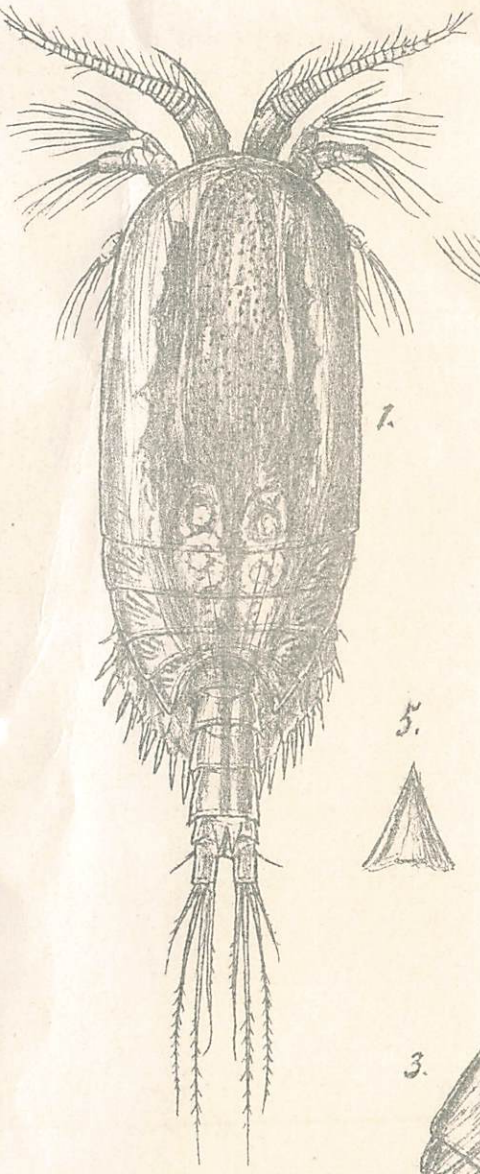
Figs. 1—3 on Pl. I magnified about 100 diameters; all the other figures 300 diameters.

Pl. I.

Fig. 1. Adult female, dorsal view.
» 2. Same, viewed from left side.
» 3. Adult male viewed from right side.
» 4. Anterior extremity of cephalic segment, with the rostrum.
» 5. Rostrum viewed from front.
» 6. Anterior antenna of female.
» 7. Posterior antenna.
» 8. Mandible with palp.
» 9. Anterior lip.
» 10. Maxilla.
» 11. Anterior maxilliped.
» 12. Posterior maxilliped.
» 13. Tuberculiform process issuing from the ventral face between the insertions of the posterior maxillipeds.

Pl. II.

Fig. 1. Leg of 1st pair.
» 2. Leg of 2nd pair.
» 3. Leg of 3rd pair.
» 4. Leg of 4th pair.
» 5. Leg of last pair in female.
» 6. Anterior antenna of male.
» 7. Last pair of legs of male.
» 8. Posterior part of body from a female specimen, dorsal view.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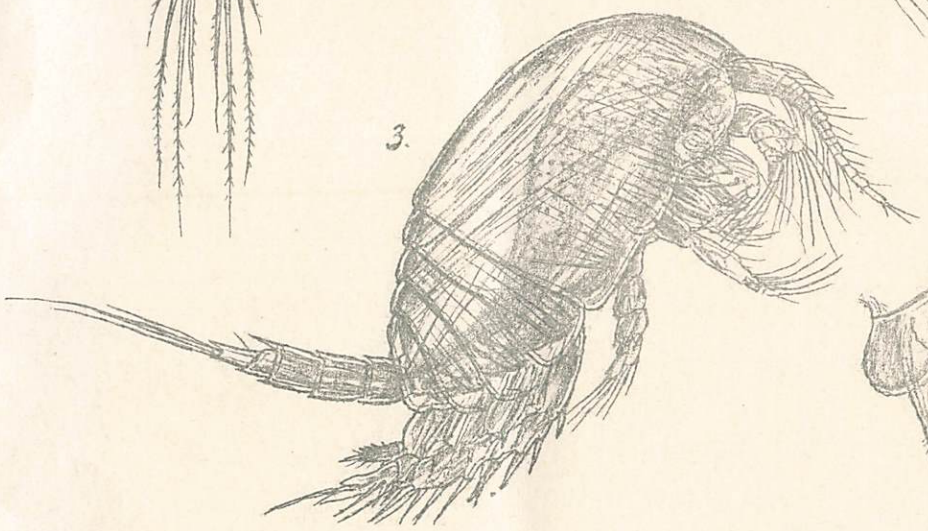
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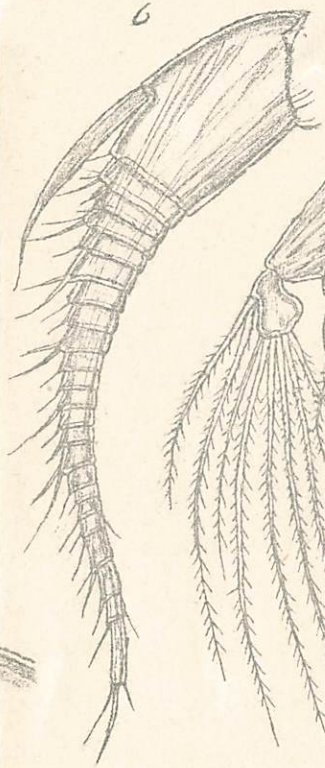
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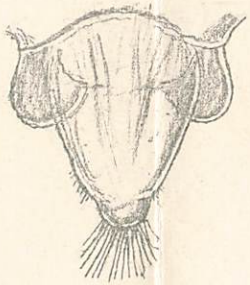
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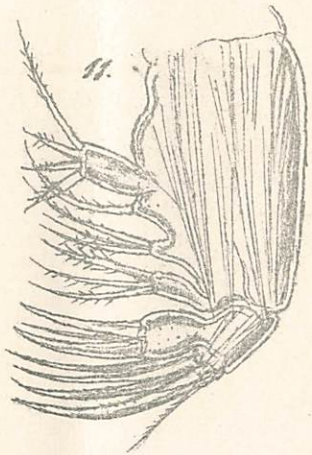
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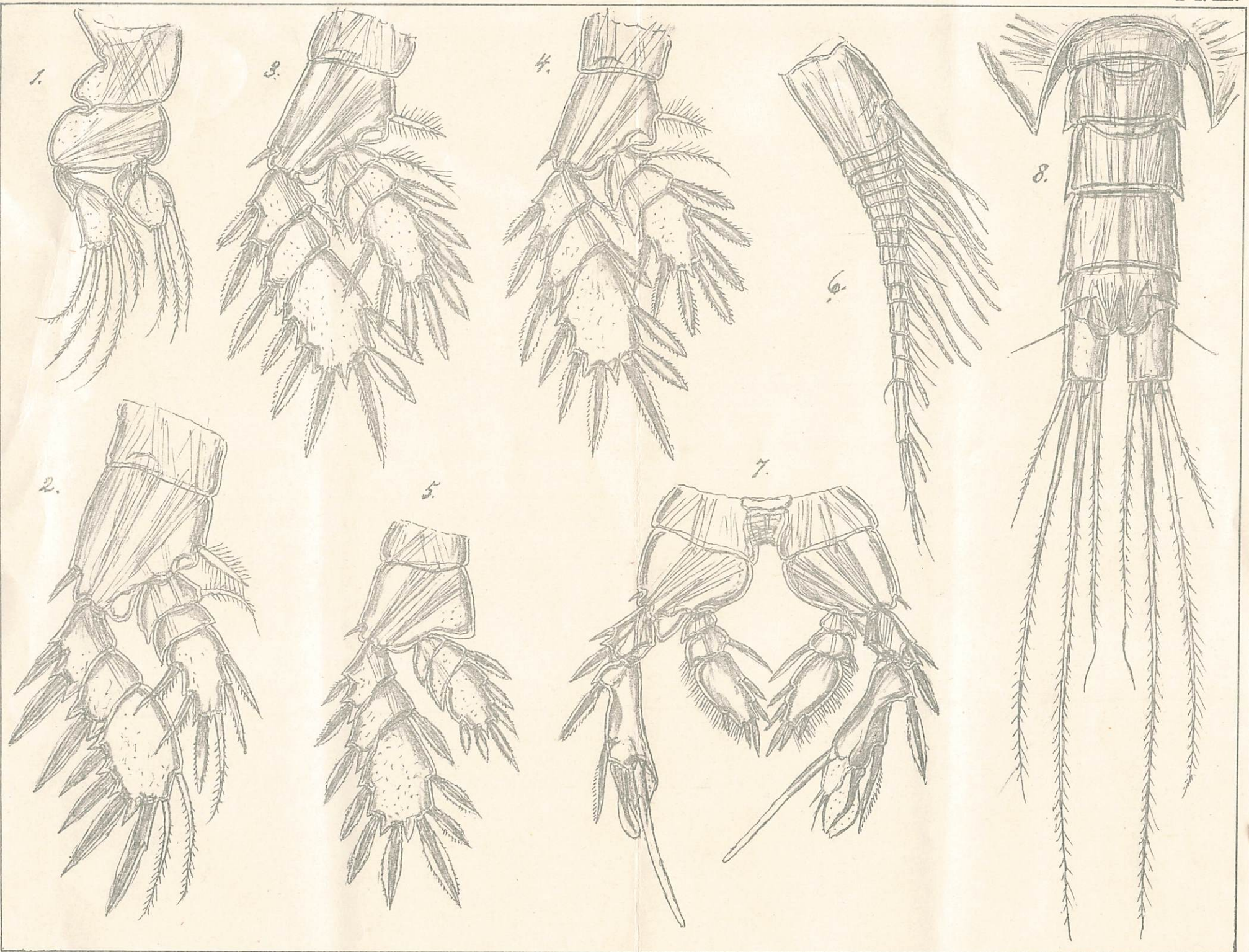
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