

AN ACCOUNT  
OF THE  
**CRUSTACEA**  
OF  
**NORWAY**

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY  
G. O. SARS

VOL. VI  
**COPEPODA**  
**CYCLOPOIDA**

PARTS IX & X

ASCOMYZONTIDÆ (concluded), ACONTIOPHORIDÆ, MYZOPON-  
TIDÆ, DYSPONTIIDÆ, ARTOTROGIDÆ, CANCERILLIDÆ

WITH 16 AUTOTYPIC PLATES



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Gen. 23. **Leptomyzon**, G. O. Sars, n.Syn: *Collocheres*, A. Scott (part).

*Generic Characters*.—Body slender, with the anterior division very little dilated. Cephalic segment with the inferior edges considerably curved in front; rostral projection very slight and obtuse at the tip. Epimeral plates of the succeeding segments rounded off. Tail very slender, and composed in female of 4 well-defined segments; genital segment without any lateral projections. Caudal rami somewhat produced, though far less slender than in the 2 preceding genera, outer seta more or less remote from the apex, dorsal bristle, however, occupying its usual place near the end of the ramus. Anterior antennæ slender, with the full number of articulations. Posterior antennæ resembling in structure those in *Collocheres*. Oral cone short and stout, carrying at the obtuse apex 2 remarkable diverging tentacular appendages, apparently attached to the posterior lip. Mandibles rather strong, with the apex distinctly denticulate, palp small, consisting of a narrow cylindrical joint, carrying on the tip a ciliated seta. Maxillæ with the inner lobe well developed and furnished at the end with 4 rather strong setæ; outer lobe much narrower, but of about the same length, and provided with only a single apical seta. Maxillipeds with the dactyli extremely slender, that of the anterior ones distinctly biarticulate. Natatory legs well developed, with the rami comparatively broader than in *Collocheres*; their armature about as in that genus. Last pair of legs distinctly biarticulate, proximal joint forming inside a linguiform expansion, distal joint rather large, oblong, and extending backwards along the genital segment.

*Remarks*.—The present new genus is established to include the form described by A. Scott as *Collocheres elegans*. This form, it is true, exhibits some characters in common with the type of the genus *Collocheres*, but differs in other particulars so materially, that in my opinion it ought to be kept apart as the type of a distinct, though nearly-allied genus. The chief differences are found in the structure of the oral cone, the last pair of legs and the caudal rami. In addition to the type species described below, the form recorded by A. Scott from Ceylon as *Collocheres Giesbrechti* is undoubtedly referable to the present genus.

61. **Leptomyzon elegans**, (A. Scott).

(Pl. LXV).

*Collocheres elegans*, A. Scott, Report for 1895 of the Lancashire Sea-Fisheries Laboratory, p. 52, Pl. V, figs. 6–15.

*Specific Characters*.—*Female*. Body exceedingly slender and elongated, with the anterior division oblong fusiform in outline, greatest width scarcely

exceeding half the length. Cephalic segment somewhat longer than the 4 succeeding segments combined, and narrowly rounded in front. Tail slender, almost attaining the length of the anterior division; genital segment rather large, exceeding in length the 3 succeeding segments combined, and slightly dilated in its anterior part. Caudal rami rather produced, being about the length of the last 2 segments combined, and somewhat lamellar, with the outer part slightly narrowed, inner edge finely ciliated; outermost seta at a considerable distance from the apex, and attached to a distinct ledge on the exterior margin, innermost seta slender, exceeding the corresponding ramus in length; the inner mediate one about half the length of the tail. Anterior antennæ nearly as long as the cephalic segment, and composed of 21 joints, the outer 3 constituting the terminal part. Posterior antennæ with the outer ramus very small and attached about in the middle of the very slender 2nd joint. Natatory legs of a similar structure to that in *Collocheres gracilicauda*, but more strongly built, especially the 4th pair. Last pair of legs scarcely extending beyond the middle of the genital segment; inner expansion of proximal joint obtusely triangular in form, unarmed; distal joint oblong oval in form, with the inner edge straight, outer gently curved and minutely ciliated, tip obliquely truncated and provided with 3 small bristles.

Body rather pellucid, of a whitish grey colour.

Length of adult female 0.87 mm.

*Male* unknown.

*Remarks.*—This form, as already mentioned, was described by A. Scott as a species of the genus *Collocheres*, the characteristic structure of the oral tube having escaped his attention, as also the difference in the arrangement of the caudal setæ.

*Occurrence.*—A few female specimens of this form were collected, many years ago, at Eggesbønæs, west coast of Norway, from a depth of about 20 fathoms.

*Distribution.*—Off Port Erin, west coast of Scotland (A. Scott).

## Gen. 24. **Scottocheres**, Giesbrecht 1897.

Syn: *Acontiophorus*, Scott (part).

*Generic Characters.*—Body of a similar slender form to that in the 3 preceding genera, the anterior division being only slightly dilated. Cephalic segment scarcely compressed, its inferior edges being quite evenly curved; rostrum



wholly absent. Epimeral parts of the 3 succeeding segments rounded off. Tail composed in female of only 3, in male of 4 segments. Caudal rami not much produced, in some cases very short, with all the setæ originating from the end. Anterior antennæ resembling in structure those in the other *Ascomyzontida*, though having the number of joints somewhat reduced; those in male distinctly hinged and provided with supplementary æsthetascs. Posterior antennæ of the usual appearance. Oral cone, however, rather peculiar and somewhat similar to that in the next family, being produced into a very narrow, more or less curved siphonal tube. Mandibles without any palp, and having the masticatory part extremely slender, setiform. Maxillæ with the lobes very unequal in size, each carrying 3 setæ. Maxillipeds comparatively slender, with the dactyli exceedingly narrow, that of the anterior ones distinctly biarticulate. Natatory legs well developed, with the rami comparatively broad and equal-sized; their armature differing slightly from that in the other genera. Last pair of legs of moderate size, biarticulate, proximal joint broadly expanded inside, distal joint lamelliform.

*Remarks.*—This genus was established by Giesbrecht, to include the form at first described by Scott as *Acontiphorus elongatus*. The differences of this form from the true *Acontiphori* have been duly pointed out by Giesbrecht. Indeed, the only character by which it seems to approach that genus, is the structure of the siphon. Otherwise it agrees fairly well with the other *Ascomyzontida*, and of course ought to be included in that family as here defined. In addition to the type species described below, Giesbrecht records another nearly-allied form from the Bay of Naples under the name of *S. longifurea*.

## 62. *Scottocheres elongatus*, (Scott).

(Pl. LXVI).

*Acontiphorus elongatus*, Scott, Ann. & Mag. Nat. Hist., Ser. 6. Vol. XII. p. 145. Pl. IX. figs. 15—20.

*Specific Characters.*—*Female.* Body comparatively narrow and elongated, with the anterior division oblong in form, greatest width scarcely exceeding half the length. Cephalic segment of moderate size and obtusely rounded in front, without any trace of a rostral projection below. The 3 succeeding segments gradually diminishing in size, with the epimeral parts not very prominent. Tail scarcely exceeding half the length of the anterior division; genital segment comparatively large, occupying more than half the length of the tail, and somewhat dilated in its anterior part, with a slight prominence on each side, just in front of the genital orifices; anal segment very small, scarcely half as long as the

preceding segment. Caudal rami short, quadrangular in form, being scarcely longer than they are broad, and transversely truncated at the end; apical setæ of moderate length, the outer mediate one remarkably thickened in its middle part. Anterior antennæ not nearly attaining the length of the cephalic segment and rather narrow, being composed of 17 joints sparingly clothed with comparatively small setæ, proximal division well marked off from the distal one, terminal part uniaarticulate. Posterior antennæ with the 2nd (basal) joint rather slender, rudimentary outer ramus attached near the end of this joint; terminal joint very small, but with the apical spine rather strong. Siphon extending about to the end of the anterior division of the body, being, as a rule, conspicuously curved, and in preserved specimens often split up into its two components, the anterior and posterior lips. 1st pair of natatory legs with the spine, issuing from the 2nd basal joint inside, lanceolate in form; terminal joint of outer ramus with only 2 setæ inside, distal spine of outer edge well developed, the other 2 very small. Same joint in 2nd and 3rd pairs with 4, in 4th pair with 3 setæ inside. Terminal joint of inner ramus in 1st pair with a conspicuous dentiform projection inside the tip; same joint in 4th pair with only a single apical spine. Last pair of legs with the inner expansion of proximal joint broadly rounded, unarmed; distal joint oval in form, with the edges minutely ciliated and the tip provided with 3 comparatively short setæ, the middle one spiniform.

*Male* resembling the female in the general shape of the body, but of smaller size, and having the tail composed of 4 well defined segments, the 1st of which is considerably swollen, to receive the comparatively large globular spermatophores. Anterior antennæ much more powerfully developed than in female, though composed of a smaller number of joints, viz., 15, the last 2 of which form together a movable terminal section, which admits of being bent upon the somewhat thickened adjoining part of the antenna.

Body (in female) rather pellucid, with a faint orange tinge, and with the translucent ovarial tubes of a somewhat darker hue.

Length of adult female about 1 mm., of male 0.70 mm.

*Remarks.*—This form, as mentioned above, was at first described by Scott as a species of the genus *Acontiphorus*, apparently on account of the somewhat similar structure of the siphon. Its generic difference has however subsequently been admitted by that author, and it was redescribed under the above name in the sixteenth Annual Report of the Fishery Board for Scotland. From the nearly-allied Neapolitan species, *S. longifurca* Giesbr., it is easily distinguished by the very short caudal rami.

*Occurrence*.—A few female specimens of this form were collected, many years ago, at Eggesbønæs, west coast of Norway, and some additional specimens, among them a single male, were recently picked up from the residue of the same collecting bottle, in which, as mentioned above, several species of *Ascomyzon* were found.

*Distribution*.—British Isles (Scott), Bay of Naples (Giesbrecht), Ceylon (A. Scott).

## Fam. 5. Acontiophoridae.

*Characters*.—General form of body resembling that in the *Ascomyzontidae*, the anterior division being more or less dilated, the posterior one attenuated. Anterior antennæ not much produced, and densely clothed with partly ciliated setæ, no distinct boundary being found, as in most of the *Ascomyzontidae*, between the proximal and distal portions; a small terminal part, however, distinguishable, formed by the outermost joints succeeding that carrying the usual æsthetask. Posterior antennæ rather unlike those in the *Ascomyzontidae*, the terminal joint being much more fully developed and provided with several spines and setæ; outer ramus comparatively large, though uniarticulate. Oral cone produced into a very narrow siphonal tube somewhat resembling that in *Scottocheres*. Mandibles with the masticatory part imperfectly developed, terminating in a simple hair-like point, which does not extend to the end of the tube; palp replaced by a single very large and densely plumose seta. Maxillæ with the basal part unusually large and massive, lobes more or less curved downwards and provided with richly ciliated setæ. Maxillipeds of the usual structure. Natatory legs likewise on the whole normally built. Last pair of legs comparatively small, with the proximal joint imperfectly defined; distal joint scarcely lamellar, and provided with several spiniform setæ.

*Remarks*.—This family is established to include the genus *Acontiophorus* of Brady, which seems to me to differ in some respects so materially from the preceding genera comprised within the family *Ascomyzontidae*, that it can hardly be associated with them. The structure of the posterior antennæ and the oral parts, in particular, is very unlike that found in the true *Ascomyzontidae*. I am inclined to believe that the 2 hitherto known species, *A. suctatus* and *ornatus*, should more properly be regarded as types of 2 nearly-allied genera, as their outward appearance is rather dissimilar, and some of the structural details also



seem to exhibit differences of more than specific value. In any case, the species described below, as the first one recorded, ought to be regarded as the type of the genus *Acontiophorus*.

Gen. 25. **Acontiophorus**, Brady 1880.

Syn: *Solenostoma*, Brady (preoccupied).

*Generic Characters*.—Anterior division of body moderately dilated, not depressed. Epimeral parts of the trunk-segments not produced, but evenly rounded off. Tail composed in female of 3, in male of 4 segments, none of them produced at the postero-lateral corners. Caudal rami of moderate size, and transversely truncated at the end, apical setæ well developed. Anterior antennæ very short, with the number of joints considerably reduced; those in male imperfectly hinged, and provided with supplementary æsthetascs. Posterior antennæ with the terminal joint rather large and scarcely narrowed distally, outer ramus attached close to the end of the 2nd (basal) joint, and cylindrical in form. Siphon exceedingly slender and elongated. Maxillæ with the inner lobe larger than the outer, and carrying on the tip 4 setæ, the 2 inner of which are densely plumose. Maxillipeds quite normal. Natatory legs with the rami comparatively slender and subequal in length; their armature resembling that in the gen. *Scottocheres*. Last pair of legs very small; distal joint provided with 5 rather unequal setæ.

*Remarks*.—The above-given generic diagnosis chiefly refers to the type species *A. scutatus*. The other species referred to this genus, *A. ornatus*, differs more or less in some of the characters here given, and should in my opinion, as noted above, more properly be removed to a separate, though closely-allied genus.

63. **Acontiophorus scutatus**, Brady.

(Pl. LXVII).

*Acontiophorus scutatus*, Brady. Monogr. of British Copepoda. Vol. III. p. 69. Pl. XC. figs. 1—10.

Syn: *Solenostoma scutatum*, Brady & Roberts.

*Specific Characters*.—*Female*. Body moderately slender, obpyriform in shape, with the anterior division broadly ovate, greatest width considerably exceeding half the length. Cephalic segment very large, occupying nearly half the length of the body, and quite evenly rounded in front; rostral projection extremely small, almost obsolete. Tail scarcely exceeding in length  $\frac{1}{3}$  of the anterior

division and having all the segments quite simple; genital segment about the length of the 2 succeeding segments combined and slightly dilated in front. Caudal rami sublinear in form, being about 3 times as long as they are broad, and scarcely at all divergent; apical setæ more or less curved outwards in their distal part, the inner mediate one exceeding the tail in length. Anterior antennæ short and rather thick at the base, tapering distally, and composed of only 11 joints clothed with slender spreading setæ, 1st, 2nd and 6th joints larger than the others; terminal part 3-articulate. Posterior antennæ fully as long as the anterior ones, and having the 2nd (basal) joint comparatively large and slightly curved in the middle, terminal joint exceeding somewhat in size the preceding one, and carrying on the blunted end 2 comparatively large spines of unequal length and finely denticulated on the edges, these spines being moreover accompanied inside by a slender ciliated seta, and outside by a somewhat shorter seta and a minute bristle; outer ramus somewhat longer than the terminal joint and provided with a long apical seta and another much shorter lateral one. Siphonal tube exceedingly long and slender, extending almost to the end of the body. Maxillæ with the outer lobe originating far in front and considerably curved, carrying on the tip 3 moderately long plumose setæ accompanied outside by a minute bristle. Maxillipeds moderately strong, dactylus of the anterior ones only slightly curved and imperfectly subdivided in the middle; basal part of the posterior ones composed of 2 well-defined joints. Natatory legs with the spines of the outer ramus narrow lancet-shaped; terminal joint of this ramus in 1st and 4th pairs with 3 setæ inside; terminal joint of inner ramus in 3rd and 4th pair with only a single spine on the tip. Last pair of legs with the distal joint rather small, rounded oval in form, and carrying inside 2 short setæ, outside 2 much longer setæ attached close together to a distinct ledge and partly crossing each other, and at the somewhat exerted tip another similar seta. Ovisacs oblong in form, and closely appressed to the tail, each containing a rather limited number of ova, in some cases only 4 arranged in a single row.

*Male* considerably smaller than female, and exhibiting the usual sexual differences. Anterior antennæ composed of the same number of joints as in the female, though their mutual relation is rather different; terminal part consisting of only a single narrow lamellar joint; æsthetask issuing from the preceding joint very largely developed.

Colour (in female) generally light yellowish brown, with darker intestine and ovarial tubes.

Length of adult female about 1 mm.

*Remarks.*—This form was at first recorded by Messrs. Brady and Robertson under the name of *Solenostoma scutatum*. The generic name being however preoccupied, it was redescribed and figured by the former author in his monograph under the above name. It is a very distinct and easily recognizable form, especially distinguished by the unusually short anterior antennæ and the extraordinary development of the siphon.

*Occurrence.*—I have met with this form in 2 different localities on the west coast of Norway, viz., at Kalvaag and Aalesund. In the latter place it occurred not unfrequently at a depth of about 10 fathoms among algæ and other marine growths.

*Distribution.*—British Isles (Brady), coast of France (Canu), Mediterranean (Claus, Giesbrecht).

## Fam. 6. Myzopontiidæ.

*Characters.*—General form of body resembling that in some of the *Ascomyzontidæ*, being comparatively slender, with the anterior division moderately broad, and the cephalic segment scarcely projecting at the postero-lateral corners. Tail rather produced and of quite normal appearance, being composed in female of 4, in male of 5 segments. Anterior antennæ slender, with the number of joints somewhat reduced; terminal part not defined, the usual æsthetask issuing from the last joint, near the tip. Posterior antennæ comparatively small, but with the terminal joint more developed than in the *Ascomyzontidæ*, outer ramus rudimentary. Oral cone more or less produced. Mandibles without any palp. Maxillæ and maxillipeds on the whole normal. Natatory legs resembling in structure those in the *Ascomyzontidæ*. Last pair of legs with the proximal joint imperfectly defined from the segment, distal joint very small or of moderate size.

*Remarks.*—This is another family, which I have found it necessary to establish in order to include the 2 genera *Myzopontius* and *Neopontius*, the systematic position of which has appeared rather doubtful. Giesbrecht refers both these genera to his sub-family *Dyspontiinæ*, apparently on account of the somewhat similar structure of the anterior antennæ; but in other respects they differ very conspicuously from the true *Dyspontiinæ*, both as regards the outward appearance of the body and the structural details, while on the other hand they exhibit, several



characters in common, as indicated in the above diagnosis. As the genus *Myzopontius* was the first established of the two, the name of the family must be derived from that genus.

Gen. 26. **Myzopontius**, Giesbrecht, 1895.

*Generic Characters.*—Anterior division of body moderately dilated, with the cephalic segment comparatively large, and the epimeral parts of the trunk-segments only slightly angular. Tail slender, though not much elongated. Caudal rami moderately produced. Anterior antennæ slender and only sparingly setiferous; those in male distinctly hinged, and provided with supplementary æsthe-tasks. Posterior antennæ likewise comparatively slender, with the penultimate joint well defined and the terminal joint rather elongated. Oral cone produced into a slender siphonal tube. Mandibles very narrow. Maxillæ with the inner lobe shorter than the outer, and provided with only a single apical seta. Both pairs of maxillipeds very slender. Terminal joint of outer ramus in 1st pair of natatory legs with 3 setæ inside; same joint in the 3 succeeding pairs with 5 setæ. Last pair of legs very small.

*Remarks.*—This genus was established in the year 1895 by Giesbrecht, to include a species found by him in the Bay of Naples. In the elaborate monograph of the *Asterocheridæ* by the same author, this genus was placed at the head of the sub-family *Dyspontiinae*, and its differences from the more typical genera, showing an approach to the *Asterocherinae* (= *Ascomyzontidæ*), were pointed out. The genus as yet only comprises a single species, to be described below.

64. **Myzopontius pungens**, Giesbr.

(Pl. LXVIII).

*Myzopontius pungens*, Giesbrecht, *Asterocheridæ*, p. 106, Pl. 1, fig. 6, Pl. 6, figs. 1—14.

*Specific Characters.*—*Female.* Body moderately slender, with the anterior division oblong oval in outline, greatest width slightly exceeding half the length. Cephalic segment very large, occupying almost half the length of the body, frontal edge evenly curved, pleural parts incurved and rather broad; rostral projection extremely small. The 3 succeeding segments gradually diminishing in size and having the epimeral parts slightly angular behind. Tail scarcely attaining half

the length of the anterior division and narrow cylindrical in form; genital segment of moderate size, with the anterior part slightly dilated, forming on each side a rounded prominence. Caudal rami slightly exceeding in length the anal segment and sublinear in form, being scarcely at all divergent; outermost seta, together with the dorsal bristle, slightly remote from the apex; middle apical seta of moderate length. Anterior antennæ slender, though scarcely exceeding half the length of the cephalic segment, and composed of 12 joints, the last one much the longest. Posterior antennæ rather narrow, with the terminal joint considerably produced, being almost as long as the 2nd (basal) joint, and carrying 3 apical and one lateral seta, middle apical seta much longer than the other 2, lateral seta attached near the base. Siphon extending about to the end of the cephalic segment. Maxillæ with the outer lobe rather narrow, sublinear in form, and carrying on the tip 2 moderately long setæ; inner lobe conical in form with the apical seta very slender. Anterior maxillipeds with the dactylus exceedingly narrow and elongated, distal part evenly curved and clothed inside with minute spinules. Posterior maxillipeds with the hand unusually narrow, dactylus normal. Natatory legs moderately strong, with the spines of the outer ramus finely denticulate; 1st joint of inner ramus in 1st pair unusually broad and, like the 2nd basal joint, provided on the lower face with a rounded, boss-like prominence. Last pair of legs extremely minute; distal joint provided with 3 small bristles, one apical and 2 lateral.

Body, according to Giesbrecht, nearly colourless, with reddish orange translucent intestine and lateral coeca; eye very large and bright red.

Length of adult female about 1 mm.

*Remarks.*—This Copepod resembles in its outward appearance certain forms of the *Ascomyzontidae*, but is easily distinguishable by the rather different structure of the anterior antennæ. The specific name proposed by Giesbrecht alludes to the narrowly-produced siphon, which in some cases is seen projecting from the body at nearly a right angle, as indicated in the side-view figure given by Giesbrecht.

*Occurrence.*—A solitary, but well preserved female specimen of this form was found in a sample taken at Korslavn, south coast of Norway, from a depth of about 40 fathoms, muddy sand.

*Distribution.*—Bay of Naples (Giesbrecht), Franz Joseph Land (Scott).

Gen. 27. **Neopontius**, Scott, 1898.

*Generic Characters*.—Anterior division of body only slightly dilated, with some of the segments angularly produced laterally. Cephalic segment of moderate size and narrowed in front; rostral projection well marked. Tail very slender, with the genital segment in female long and narrow. Caudal rami rather produced and somewhat lamellar; apical setæ comparatively short. Anterior antennæ of moderate size and densely clothed with slender, curved setæ; those in male imperfectly hinged and without any supplementary æsthetascs. Posterior antennæ rather stout, with the 2 middle joints imperfectly defined in female, terminal joint not much produced. Oral cone comparatively short, not being produced into a siphonal tube. Mandibles less slender than in *Myzopontius*, and distinctly denticulated at the tip. Maxillæ with the inner lobe larger than the outer, and carrying at the tip 4 setæ. Maxillipeds comparatively strongly built, dactylus of the anterior ones armed inside, at some distance from the end, with a very conspicuous curved secondary spine. Natatory legs of a similar structure to that in *Myzopontius*. Last pair of legs, however, more fully developed, with the distal joint rather produced and somewhat spatulate in form.

*Remarks*.—This is a very distinct genus, exhibiting, as it does, several well-marked differences from *Myzopontius*. Yet its affinity to that genus is evidently closer than to any other of the siphonostomous Cyclopoida, and this has also been recognised both by Scott and Giesbrecht.

65. **Neopontius angularis**, Scott.

(Pl LXIX).

*Neopontius angularis*, Scott, Sixteenth Annual Report of the Fishery Board for Scotland, Part III, p. 271, Pl. XIV, figs. 1—11.

*Specific Characters*.—*Female*. Body very slender, with the anterior division oblong oval in outline and somewhat abruptly truncated behind. Cephalic segment scarcely occupying more than  $\frac{1}{3}$  of the total length and narrowly rounded in front; rostral projection well marked, but incurved, and acute at the tip. The succeeding trunk-segments rather dissimilar both in size and form, the anterior one being comparatively simple, whereas the 3rd segment is unusually broad, with the epimeral parts prominent and triangularly pointed behind; penultimate segment much smaller, with the epimeral parts angularly rounded; last segment very narrow. Tail almost attaining the length of the anterior division and rather narrow; genital segment longer than the 3 succeeding segments combined, and



widening slightly in front. Caudal rami exceeding in length the last 2 segments combined and conspicuously lamellar, inner edge finely ciliated, outer edge exhibiting, somewhat beyond the middle, a distinct ledge to which the outermost seta, together with the dorsal bristle, is attached; apical setæ comparatively short, but rather coarse and densely plumose. Anterior antennæ somewhat exceeding half the length of the cephalic segment, and composed of 12 joints, the 2nd of which is rather large, being fully as long as the 4 succeeding joints combined; terminal joint elongated, club-shaped. Posterior antennæ comparatively short, but rather stout, with the 2 middle joints confluent; terminal joint not much prolonged, and carrying 4 elongated and finely ciliated setæ, 3 apical and one lateral. Oral cone extending only slightly beyond the insertion of the posterior maxillipeds, and evenly tapered distally. Mandibles apparently biarticulate, and very finely denticulate at the tip. Maxillæ with the outer lobe scarcely more than half as long as the inner, and carrying on the tip 2 moderately long setæ. Anterior maxillipeds with the distal part of the dactylus, as also the secondary spine, finely denticulate inside. Posterior maxillipeds with the hand imperfectly defined from the basal part; terminal part of the dactylus denticulate. Natatory legs moderately strong, with the spines of the outer ramus dagger-like. Last pair of legs with the distal joint well developed, sub-spatulate in form, and provided with 3 setæ, 2 issuing from the transversely truncated end, the 3rd from the lower face at some distance from the apex; outer edge of the joint minutely ciliated, inner projecting near the end to a dentiform process.

*Male*, as usual, smaller than female, and having the anterior division of the body less angular in shape. Anterior antennæ more strongly built, and composed of 14 joints, those of the distal part conspicuously thickened, 10th joint armed in front with 2 slender spines, apical joint small, rounded. Posterior antennæ with the 2 middle joints well defined; the posterior maxillipeds also quite normally developed.

Colour (in female) yellowish grey, with scattered pigmentary patches of an ochraceous hue on the dorsal face of the anterior division of the body.

Length of adult female 1.35 mm., of male 1.10 mm.

*Remarks.*—This is the only as yet known species of the genus, and may easily be recognized by the peculiar angular shape of the anterior division of the body, which, especially in the female, is very conspicuous and indeed has given rise to the specific name proposed by Scott.

*Occurrence.*—I have long been acquainted with this peculiar form, of which some few specimens were collected, many years ago, at Eggesbønæs, west

coast of Norway, from a depth of about 20 fathoms. I have, however, not met with it in other localities, and it thus seems to be of very rare occurrence.

*Distribution.*—Scottish coast (Scott).

## Fam. 7. Dyspontiidæ.

*Characters.*—General form of body, as a rule, very broad and depressed, with the anterior division much expanded. Cephalic segment large and arcuate in front, with the postero-lateral corners produced, and the pleural parts very broad, leaving in front only a narrow space for the insertion of the antennæ and oral parts. Epimeral parts of the trunk-segments forming well-defined lappets projecting laterally. Last segment, however, as usual, not expanded and very small. Tail comparatively short, and composed in female of 4, in male of 5 segments; genital segment much expanded in its anterior part. Anterior antennæ slender and narrow, with the number of joints more or less reduced, last joint club-shaped and carrying near the end the usual æsthetask; those in male more or less distinctly hinged and provided with supplementary æsthetasks. Posterior antennæ very small, 4-articulate, outer ramus rudimentary. Oral cone generally much produced. Mandibles without any palp, masticatory part slender styloform, extending to the end of the siphon. Maxillæ with both lobes very narrow, the inner one the larger and generally provided with only a single apical seta, outer lobe with 2 such setæ. Both pairs of maxillipeds very fully developed. Natatory legs more or less incurved, with the rami comparatively slender, the inner one in 4th pair more or less reduced, in some cases wholly wanting. Last pair of legs extremely small and rudimentary, being only represented by a minute knob-like joint accompanied outside by the usual seta.

*Remarks.*—The present family does not quite answer to the sub-family *Dyspontiinae* of Giesbrecht, in which the 2 preceding genera are also included, as also 2 other genera which I have felt justified in removing, viz., the genera *Artotrogus* and *Dystrogus*. In the restriction thus adopted, the family *Dyspontiidæ* forms a very natural group, comprising a number of genera, which agree pretty well in the more essential characters. In addition to the 5 genera treated of in the following pages, the 2 genera *Pteropontius* and *Sestropontius*, established by Giesbrecht, belong to the present family, which thus at present comprises no less than 7 different genera.

Gen. 28. **Dyspontius**, Thorell, 1859.Syn: *Gallopontius*, Giesbrecht.

*Generic Characters.*—Anterior division of body broad and expanded, with the epimeral lappets well marked; those of penultimate segment, however, very small. Tail short, with the genital segment considerably expanded. Anterior antennæ in female generally 9-articulate, with the 2nd joint the largest. Siphon rather strong, with the basal part only slightly dilated. Maxillæ with the lobes not very unequal, the inner one carrying a single apical seta, the outer one 2 such setæ. Maxillipeds moderately slender. Natatory legs with the rami comparatively narrow, terminal joint of outer ramus in 1st pair small, with only 2 spines outside and 2 setæ inside. 4th pair of legs with the outer ramus well developed, inner however wholly absent. Free joint of last pair of legs with only 2 apical bristles.

*Remarks.*—This genus, the type of the present family, was established in the year 1859 by Thorell, who placed it together with the genus *Ascomyzon* within his family *Ascomyzontidæ*. The genus *Gallopontius*, at first established by Giesbrecht for a Neapolitan species, *G. fringilla*, was subsequently withdrawn by that author and identified with Thorell's genus. In addition to the above-named species another Neapolitan species was described as *D. passer*.

The chief characters of the present genus are found in the form of the siphon, the armature of the terminal joint of the outer ramus in the 1st pair of legs, and the total absence of an inner ramus in the 4th pair. In the last-named character it however agrees with 2 other genera, viz., *Cryptopontius* and *Pteropontius*. To the fauna of Norway belongs only the type species, to be described below.

66. **Dyspontius striatus**, Thorell.

(Pl. LXX).

*Dyspontius striatus*. Thorell, Bidrag til k annedomen om Crustaceer, som lefva i arter af sl gdet Ascidia, p. 81. Pl. XIV, fig. 22.

Syn: *Gallopontius rotundus*, Giesbrecht.

*Specific Characters.*—*Female*. Body pronouncedly depressed, with the anterior division broad and expanded, greatest width almost equalling the length. Cephalic segment very large, occupying rather more than half the total length, postero-lateral corners prominent, frontal part evenly rounded, without any dorsal crest; pleural parts of the segment longitudinally striated. Epimeral lappets of the 2 succeeding segments well developed, those of penultimate segment, however,



very small. Tail scarcely exceeding in length  $\frac{1}{3}$  of the anterior division; anterior part of genital segment considerably expanded. Caudal rami comparatively short, being only slightly longer than they are broad, outermost seta somewhat remote from the apex, inner mediate one a little longer than the tail. Anterior antennæ about half the length of the cephalic segment, and composed of 9 joints, 2nd joint the longest; terminal joint somewhat exceeding in length the 2 preceding joints combined. Posterior antennæ with the terminal joint about as long as the preceding one; middle apical seta rather slender, the other 2 short. Siphon comparatively strong and gradually tapered distally, extending somewhat beyond the limits of the cephalic segment. Maxillæ with the inner lobe only slightly longer than the outer and rather narrow, apical seta scarcely as long as the lobe; apical setæ of outer lobe rather slender. Anterior maxillipeds with the dactylus very slender and elongated, terminating in a short, slightly curved claw, and armed at some distance from this claw with a small secondary spine. Posterior maxillipeds normal. Natatory legs with the spines of the outer ramus comparatively short, 2nd basal joint in 2nd—4th pairs angularly produced inside; 4th pair with the outer ramus fully as large as in the 2 preceding pairs and armed in a similar manner; of an inner ramus not the slightest rudiment present. Ovisacs globular in form.

*Male* considerably smaller than female, and having the anterior division of the body less broad. Genital segment greatly swollen, to receive the 2 globular spermatophores. Anterior antennæ composed of 11 joints, and distinctly hinged, the last 2 joints forming together a movable part, which admits of being bent upon the adjoining part of the antenna; 8th joint somewhat dilated, and armed in the middle of the anterior edge with a short spine.

Colour of female generally pale yellowish grey, with a few small reddish spots on the cephalic segment; intestine and its distinctly lobular coeca of a darker yellow hue.

Length of adult female amounting to 1.45 mm., of male to 1.10 mm.

*Remarks.*—This form was described by Thorell from a solitary female specimen taken by Lilljeborg in the open sea, and was supposed by that author to be, like *Ascomyzon Lilljeborgi*, an internal parasite of Ascidiæ. It has subsequently been recorded in both sexes by several other authors, though in some cases it appears somewhat doubtful, whether the descriptions in reality refer to the present species or to some other nearly-allied form. The form at first recorded by Giesbrecht from the Bay of Naples as *Gallopontius rotundus* has subsequently been identified by that author with the present species. From the

other 2 Neapolitan species, *D. fringilla* and *D. passer*, it is at once distinguished by the different form of the cephalic segment and the absence of any frontal crest.

*Occurrence*.—I have met with this characteristic form in many places of the Norwegian coast, from the Christiania Fjord up to Finmark (Hammerfest). All the specimens have been taken free in the sea among algæ and other marine growths, and there is indeed little probability that this form ever, as supposed by Thorell, has its abode within the branchial cavity of Ascidia.

*Distribution*.—Christineberg (Thorell), British Isles (Brady), coast of France (Cann), Bay of Naples (Giesbrecht).

## Gen. 29. *Cryptopontius*, Giesbr., 1899.

*Generic Characters*.—Anterior division of body less expanded and less depressed than in *Dyspontius*, with the epimeral lappets more densely crowded and curved backwards; those of penultimate segment very small, almost wholly concealed. Tail short, but with unusually long apical setæ. Structure of the 2 pairs of antennæ about as in *Dyspontius*. Oral cone with the basal part conspicuously thickened and terminating in a very slender siphonal tube. Maxillæ with the lobes rather unequal in length and very narrow; apical setæ on both lobes slender. Anterior maxillipeds with the dactylus exceedingly slender and elongated. Posterior maxillipeds normal. Natatory legs with the rami comparatively less slender than in *Dyspontius*; outer ramus of 1st pair without any seta inside the 1st joint, terminal joint well developed, with 3 spines outside and 3 setæ inside. 4th pair of legs without any inner ramus. Last pair of legs exhibiting a rudimentary structure similar to that in *Dyspontius*.

*Remarks*.—The above generic diagnosis chiefly refers to the species described below, as I am by no means certain that the other 3 species referred by Giesbrecht to this genus are in reality congeneric. The chief differences from *Dyspontius* are found in the general form of the body, the structure of the siphon, and the armature of the outer ramus of the 1st pair of legs.

### 67. *Cryptopontius brevifurcatus*, Giesbr.

(Pl. LXXI).

*Cryptopontius brevifurcatus*, Giesbrecht, *Asterocheridæ*, p. 109, Pl. 1, fig. 7, Pl. 8, figs. 1–12.

*Specific Characters*.—*Female*. Body less expanded than in most other *Dyspontiidæ*, with the anterior division oblong oval in outline, greatest width

only slightly exceeding half the length. Cephalic segment very large, nearly twice as long as the remainder of the body, and narrowly rounded in front, with no crista dorsally; rostral prominence very small. Epimeral lappets of the 2 succeeding segments rather broad and curved backwards; those of penultimate segment extremely small and conical in form, being almost wholly concealed in the dorsal view of the animal. Tail scarcely exceeding in length  $\frac{1}{4}$  of the anterior division, genital segment much dilated in its anterior part. Caudal rami very short, being scarcely longer than they are broad, and transversely truncated at the end, outermost seta attached close to the apex and much shorter than the innermost one; inner mediate seta twice as long as the outer, and attaining about half the length of the body. Anterior antennæ of moderate length and composed of 9 joints, the elongate 2nd joint however exhibiting at the base and at the end slight traces of a subdivision; terminal joint somewhat longer than the 2 preceding ones combined. Posterior antennæ with the last 9 joints of about equal size; middle apical seta rather slender and flexuous. Siphon extremely slender, extending almost to the end of the anterior division of the body. Maxillæ with the outer lobe scarcely more than half as long as the inner and having the 2 apical setæ rather unequal in length; apical seta of inner lobe very slender. Anterior maxillipeds with the dactylus much elongated and narrow, secondary spine of moderate size and attached at a short distance from the apical claw. Posterior maxillipeds with the hand densely ciliated outside. 1st pair of legs considerably smaller than the 2 succeeding pairs, but having the terminal joint of the outer ramus well developed; 2nd and 3rd pairs rather strongly built, with the 2nd basal joint lamellarly produced inside; 4th pair with the outer ramus smaller than that of the 2 preceding pairs, but otherwise of a very similar structure, inner ramus wholly absent. Last pair of legs about as in *Dyspontius striatus*.

*Male*, as usual, smaller than female, and having the anterior division somewhat more depressed. Anterior antennæ composed of only 10 joints, no apical joint being cut off; 8th joint somewhat dilated and exhibiting near the end in front a short dentiform projection.

Body in female of a whitish grey colour, with a faint yellow tinge.

Length of adult female 0.90 mm. of male 0.75 mm.

*Remarks.*—I cannot doubt that the above-described form is identical with Giesbrecht's species, though there are some few points of discrepancy. It is an easily recognizable species, differing conspicuously from the other *Dyspontiidæ* in the general form of the body, especially as regards the female.



*Occurrence.*—The only place, where I have met with this form, is at Korshavn, south coast of Norway. It occurred here occasionally on a sandy bottom, at a depth of about 40 fathoms.

*Distribution.*—Bay of Naples (Giesbrecht).

### Gen. 30. **Arctopontius**, G. O. Sars, n.

*Generic Characters.*—Anterior division of body greatly expanded, with the cephalic segment exceedingly large and prominent at the postero-lateral corners; epimeral lappets of the 3 succeeding segments well developed and produced laterally. Tail comparatively short, with the genital segment unusually broad, being expanded on each side in a somewhat similar manner to that in the trunk-segments. Anterior antennæ comparatively short, 8-articulate (in female). Posterior antennæ very small, but of the usual structure. Siphon resembling in structure that in *Dyspontius*, but less produced. Maxillæ with the lobes rather unequal in size. Both pairs of maxillipeds, but especially the anterior ones, very strongly built. 1st pair of natatory legs with the terminal joint of the outer ramus carrying inside 3 setæ and outside only 2 spines; 4th pair with the outer ramus normally developed, inner very small, biarticulate. Last pair of legs still more rudimentary than in the 2 preceding genera.

*Remarks.*—This new genus differs from the 2 preceding ones in the very broad and flattened form of the body, the comparatively short antennæ, the very powerfully developed maxillipeds, and, finally in the presence on the 4th pair of legs of a distinct, though rather imperfectly developed inner ramus. It comprises as yet only a single species, to be described below.

#### 68. **Arctopontius expansus**, G. O. Sars, n. sp.

(Pl. LXXII).

*Specific Characters.*—*Female.* Body very broad and pronouncedly depressed, with the anterior division almost as broad as it is long. Cephalic segment occupying more than half the total length, postero-lateral corners considerably projecting, free edges evenly curved, front narrowly rounded, without any dorsal crest; rostrum of the usual short linguiform-shape. Epimeral lappets of the 3 succeeding segments rather produced; those of penultimate segment resembling in shape the preceding ones, though somewhat smaller. Tail scarcely exceeding

in length  $\frac{1}{3}$  of the anterior division; genital segment remarkably dilated in its anterior part, forming on each side a large wing-like expansion somewhat similar in shape to the epimeral lappets of the trunk-segments. Caudal rami short, being scarcely longer than they are broad; outermost seta at some distance from the apex and about the length of the innermost, the 2 median setæ not much prolonged. Anterior antennæ not nearly attaining half the length of the cephalic segment, and composed of only 8 joints, the 2nd much the longest, terminal joint scarcely longer than the 2 preceding joints combined. Posterior antennæ very small, with the terminal joint somewhat longer than the penultimate one, middle apical seta not much prolonged. Siphon rather coarse, extending about midway between the insertion of the posterior maxillipeds and that of 1st pair of legs. Maxillæ with the inner lobe almost twice as long as the outer and narrowly exerted distally, apical seta comparatively short, those of the outer lobe subequal in length. Anterior maxillipeds remarkably powerful, with the dactylus exceedingly strong and hamiformly curved at the tip, secondary spine very small. Posterior maxillipeds likewise rather strongly built, and having the terminal claw of the dactylus densely clothed with small denticles. 1st pair of legs, as usual, somewhat smaller than the 2 succeeding ones, which are rather strongly built, with the 2nd basal joint triangularly produced inside. 4th pair of legs with the outer ramus normal, inner ramus, however, very imperfectly developed, forming a small incurved stem composed of only 2 subequal joints, each carrying a single short seta. Free joint of last pair of leg extremely minute and apparently only provided with a single small bristle

Colour not yet ascertained.

Length of adult female about 2 mm.

*Male* unknown.

*Remarks.*—This form may be readily recognised from the other members of the present family by its very broad depressed body, and the greatly expanded genital segment. Only the female sex is as yet known.

*Occurrence.*—Only 2 female specimens of this form have hitherto come under my notice. They were taken, many years ago, at Hammerfest, western Finmark, from a depth of about 20 fathoms.

Gen. 31. **Bradypontius**, Giesbr., 1895.Syn: *Artotrogus*. Brady (part).

*Generic Characters*.—Anterior division of body more or less expanded, with the cephalic segment large and considerably produced at the postero-lateral corners; epimeral lappets of the trunk-segments well defined and successively diminishing in size behind. Tail somewhat more produced than in the 3 preceding genera, with the genital segment moderately dilated. Anterior antennæ more or less slender, and composed of a somewhat varying number of joints in the different species. Posterior antennæ of the usual structure. Siphon comparatively slender, with the basal part somewhat thickened. Maxillæ with the lobes more or less unequal. Maxillipeds comparatively slender. Natatory legs rather strongly built; terminal joint of outer ramus in 1st pair with 3 spines outside and 3 setæ inside; 4th pair with the inner ramus distinctly 3-articulate, though in most cases rather feebly developed, with some of the setæ reduced. Last pair of legs somewhat less rudimentary than in the preceding genera, the free joint being provided with 3 bristles, 2 apical and one lateral.

*Remarks*.—The chief character by which this genus is distinguished, as compared with the 3 preceding ones, is the presence on the 4th pair of legs of a distinctly 3-articulate inner ramus, which however in most cases is rather feebly developed. Otherwise it exhibits on the whole a rather close relationship to the typical genus *Dyspontius*. 4 species referable to the present genus will be described below, and a 5th species has been recorded by Giesbrecht from the Bay of Naples under the name of *B. siphonatus*.

69. **Bradypontius magniceps** (Brady).

(Pl. LXXIII).

*Artotrogus magniceps*, Brady, Monograph of British Copepoda, Vol. III, p. 61, Pl. XCIII, figs. 1—9.Syn: *Artotrogus orbicularis*, Brady & Roberts. (not Boeck)." ? — *Normanni*, Canu (not Brady)." ? *Bradypontius Canui*, Giesbrecht.

*Specific Characters*.—*Female*. General form of body somewhat similar to that in *Dyspontius striatus*, the anterior division being rather expanded, with the greatest width almost equalling the length. Cephalic segment very large, occupying about half the total length, and having the free edges evenly arched, postero-lateral corners rather produced, frontal part rounded, without any dorsal crest. Epimeral lappets of the 3 succeeding segments well defined and pointing obliquely backwards; those of penultimate segment of same shape as the preceding ones, though



somewhat smaller. Tail not attaining half the length of the anterior division; genital segment moderately dilated in its anterior part; anal segment exceeding in length the 2 preceding ones combined. Caudal rami rather produced, being more than twice as long as they are broad, and fully attaining the length of the anal segment; outermost seta not far from the apex and somewhat shorter than the innermost; the 2 middle setæ of moderate length. Anterior antennæ about half the length of the cephalic segment, and composed of 8 (or 9) joints, the 2nd being much the largest; terminal joint almost the length of the 2 preceding ones combined. Posterior antennæ with the terminal joint longer than the penultimate one, middle apical seta of moderate length, the other 2 very small. Siphon rather slender, extending beyond the limits of the cephalic segment. Mandibles narrow styliform, and distinctly denticulated at the apex. Maxillæ with the lobes comparatively narrow and somewhat unequal in length, apical seta of the inner one quite short, those of the outer slender and subequal. Maxillipeds well developed, dactylus of the anterior ones moderately slender, with a small secondary spine at some distance from the end; terminal claw comparatively short. 1st pair of natatory legs not much smaller than the 2 succeeding ones, seta at the inner corner of the 1st basal joint conspicuously thickened. 4th pair of legs with the inner ramus much narrower than the outer and only slightly exceeding in length the 2 first joints of this ramus combined, setæ present in the usual number, but rather reduced in size. Free joint of last pair of legs small, and as in the other species provided with 3 bristles, the innermost one the longest. Ovisacs rather large and globular in form.

Colour not yet ascertained.

Length of adult female 1.80 mm.

*Male* unknown.

*Remarks.*—I think I am right in identifying the above-described form with Brady's species, as it agrees fairly well in its outward appearance with the figure given by that author. The apparent differences found in some of the structural details may indeed be due to a less careful examination by the said author. It appears to me somewhat more doubtful, if the form described by Canu as *Artotrogus Normani*, and subsequently named by Giesbrecht *Bradypontius Canui*, is in reality identical with the present species, as set forth by the last-named author in his Monograph of the *Asterocheridae*; and the form briefly described and figured by Giesbrecht in the same Monograph as *B. magniceps*, also seems to differ in some respects.

The present species was at first erroneously identified by Brady and Robertson with *Artotrogus orbicularis* Boeck; and though this mistake was sub-

sequently corrected, it was still referred by Brady in his Monograph to Boeck's genus, which in reality is so very different, that in my opinion it cannot even be included in the present family.

*Occurrence.*—Only a few female specimens of this form have hitherto come under my notice. They were taken free in the sea in two widely-distant localities, viz., at Aalesund, west coast of Norway, and at Hammerfest, western Finmark.

*Distribution.*—British Isles (Brady), ? coast of France (Canu).

### 70. *Bradypontius papillatus* (Scott).

(Pl. LXXIV).

*Arctovogus papillatus*, Scott, Sixth Annual Report of the Fishery Board for Scotland, Appendix, p. 232, Pl. VIII, figs. 7—12.

Syn: *Bradypontius chelifer*, Giesbr.

*Specific Characters.*—*Female.* Anterior division of body rather broad in its posterior part, greatest width however not quite equalling the length. Cephalic segment very large, occupying more than half the total length, and gradually contracted anteriorly, postero-lateral corners very prominent, frontal part narrowly produced, with a very distinct crest running along its dorsal face; rostral projection well marked, incurved. Epimeral lappets of the 2 succeeding segments well developed and considerably divergent; those of penultimate segment, however, rather small and conically pointed. Tail only slightly exceeding in length  $\frac{1}{3}$  of the anterior division; genital segment moderately dilated in front; anal segment not attaining the length of the 2 preceding ones combined. Caudal rami about twice as long as they are broad, and equal in length to the anal segment; outermost seta at some distance from the apex, and shorter than the innermost; the 2 middle setæ of moderate size. Anterior antennæ about half the length of the cephalic segment, and composed of 9 joints, 2nd joint the largest, terminal joint exceeding in length the 2 preceding joints combined. Posterior antennæ resembling in structure those in *B. magniceps*, except that the outermost apical seta is comparatively longer. Siphon scarcely extending beyond the insertion of the 1st pair of legs. Maxillæ with the lobes less slender than in *B. magniceps*, apical seta of the inner one short, those of outer lobe very coarse, spiniform, and finely denticulated. Anterior maxillipeds with the dactylus rather strong and provided at some distance from the end with 2 small thumb-like prominences, against which the curved terminal claw may admit of being impinged; secondary spine very small and placed outside the said prominences. Posterior maxillipeds normal. Natatory legs resembling in structure those in *B. magniceps*, except that the inner

ramus in 4th pair is much smaller, scarcely attaining the length of the 2 first joints of the outer one combined, and very narrow, with some of the setæ aborted. Last pair of legs about as in the preceding species.

Colour dark yellow or orange.

Length of adult female amounting to 1.60 mm.

*Remarks.*—I cannot doubt that the above-described form is that originally recorded by Scott as *Artotrogus papillatus*, and that Giesbrecht's *Bradypontius chelifer* is the same species. It is true, that the number of joints in the anterior antennæ is indicated by both these authors to be only 8, and that the terminal part of the dactylus in the anterior maxillipeds is represented much shorter and thicker than in the specimen examined by me; but these apparent differences are in all probability due to the circumstance that the specimens examined by those authors had not arrived at full maturity, as proved by their much inferior size (1.15—1.20 mm.). In all other respects the agreement seems to be perfect. From the type species, *B. magniceps*, the present one is easily distinguished by the rather different form of the cephalic segment and of the epimeral lappets, as also by the comparatively shorter caudal rami. The very feeble development of the inner ramus on the 4th pair of legs forms another rather characteristic specific mark.

*Occurrence.*—Some few female specimens of this form were collected, many years ago, in 2 localities on the west coast of Norway, viz., at Aalesund and Eggesbømas. The specimens were taken free in the sea, at depths ranging from 20 to 40 fathoms.

*Distribution.*—British Isles (Scott), Bay of Naples (Giesbrecht).

## 71. *Bradypontius major*, G. O. Sars, n. sp.

(Pl. LXXV).

*Specific Characters.*—*Female.* General form of body somewhat similar to that in *B. papillatus*, the cephalic segment being very large and gradually contracted anteriorly, with a well-marked dorsal crest running along its frontal part. Epimeral lappets of the 3 succeeding segments more closely crowded together and less unequal than in the said species; those of penultimate segment well developed, though somewhat narrower than the others. Tail comparatively short, only slightly exceeding in length  $\frac{1}{3}$  of the anterior division; genital segment considerably dilated in its anterior part; anal segment equalling in length the 2 preceding ones combined. Caudal rami scarcely twice as long as they are broad, and shorter than the anal segment, apical setæ about as in the preceding species. Anterior antennæ not very elongated, but composed (in the specimen examined) of no less



than 13 well-defined joints, a short joint being divided off from the elongated 2nd joint both at the base and at the end, and moreover each of the 2 joints preceding the terminal one being distinctly subdivided; terminal joint about the length of these 4 joints combined. Posterior antennæ a little more slender than in *B. papillatus*, but otherwise of a very similar structure. Siphon rather produced, extending considerably beyond the limits of the cephalic segment. Mandibles very slender and distinctly denticulated at the tip. Maxillæ with the lobes narrow and rather unequal in length; apical seta of the inner one much produced, those of the outer rather slender. Anterior maxillipeds with the dactylus much more slender than in *B. papillatus*, with only a single small thumb-like process rather far from the apex, secondary spine well marked. Natatory legs with the rami comparatively less slender than in that species; inner ramus of 4th pair more fully developed, exceeding in length the first 2 joints of the outer one combined. Free joint of last pair of legs a little larger than in *B. papillatus*.

*Male* considerably smaller than female, and having the anterior division less expanded. Anterior antennæ, as in female, composed of 13 joints, 6th and 7th joints very short and less sharply defined, 10th joint conspicuously dilated and armed anteriorly with 2 slender spines, movable terminal part distinctly biarticulate. Inner ramus of 4th pair of legs comparatively longer than in female, terminal joint produced at the outer distal corner to an outward-curving denticiform projection, outer apical seta, as also that of the outer edge replaced by a short club like spine.

Body in female of a dark yellowish grey colour, and ornamented on the dorsal face with a reddish branching pigment.

Length of adult female amounting to 2.40 mm., of male to 1.95 mm.

*Remarks.*—This form is closely allied to *B. papillatus*, but of much larger size, and moreover differs conspicuously in the shape of the epimeral lappets of the trunk-segments, as also in some of the structural details, as indicated in the above diagnosis.

*Occurrence.*—Solitary specimens of this large species have been taken at Aalesund, west coast of Norway, and in the Trondhjem Fjord, at Rødbjerget, in both localities from considerable depths.

## 72 *Bradypontius caudatus*, G. O. Sars, n. sp.

(Pl. LXXVI).

*Specific Characters.*—*Femule.* Body comparatively more slender than in the other species, with the anterior division moderately expanded. Cephalic

segment large, though scarcely occupying half the total length, and only slightly contracted anteriorly, frontal crest only faintly indicated, postero-lateral corners of the segment fairly prominent. Epimeral lappets of the 3 succeeding segments moderately produced; those of penultimate segment rather smaller than the preceding ones. Tail comparatively more produced than in the other species, attaining nearly half the length of the anterior division; genital segment not much expanded in its anterior part; anal segment scarcely as long as the 2 preceding ones combined. Caudal rami about twice as long as they are broad, and slightly dilated in the middle; outermost seta rather far from the apex and much shorter than the innermost, the 2 middle setæ of moderate length. Anterior antennæ unusually slender and elongated, considerably exceeding half the length of the cephalic segment, and composed of 12 well-defined joints, the last of which is the longest. Posterior antennæ likewise rather slender, with the terminal joint nearly twice as long as the penultimate one. Siphon moderately produced, extending about to the insertion of the 1st pair of legs. Maxillæ with the lobes not very unequal; apical seta of the inner one quite short, those of the outer very coarse, spiniform and densely spinulose. Maxillipeds resembling in structure those in *B. major*, the dactylus of the anterior ones being very slender, with only a single small thumb-like process at some distance from the end, terminal claw much curved, secondary spine small. Natatory legs rather strongly built, with the exterior edge of the outer ramus coarsely serrate; inner ramus of 4th pair not much shorter than the outer, but rather narrower. Free joint of last pair of legs somewhat more produced than in the other species.

Colour reddish brown.

Length of adult female reaching to 2.90 mm.

*Male* unknown.<sup>1)</sup>

*Remarks.*—This form grows to a still larger size than *B. major*, and is indeed the largest of all the siphonostomous Cyclopoida with which I am acquainted. It moreover exhibits several well-marked differences from the other species, both as to its outward appearance and the structural details. The specific name alludes to the unusually produced tail.

*Occurrence.*—2 female specimens only of this form have come under my notice. They were taken, many years ago, at Tjøtø on the Nordland coast, from the considerable depth of 150 fathoms

<sup>1)</sup> It may be, however, that the male specimen mentioned above as belonging to *B. major*, should more properly be referred to the present species, though it was found in company with the former. Indeed, on a closer examination, I have found that the caudal rami in that specimen, as also the mutual relations of the joints in the inner ramus of the 4th pair of legs, agree better with the present species.

Gen. 32. **Cribropontius**, Giesbr. 1899.Syn: *Artotrogus*, Brady (part).

*Generic Characters*.—Body robust, with strongly chitinised integuments, and with some of the epimeral lappets very prominent. Tail somewhat produced and having the genital segment in female less expanded than in the other genera. Caudal rami lamellar, with comparatively short apical setæ. Anterior antennæ comparatively stout and scarcely at all attenuated distally. Posterior antennæ with the terminal joint comparatively short. Siphon rather strong and not much produced. Maxillæ with the lobes very unequal in size and each provided with 2 slender apical setæ. Both pairs of maxillipeds, but especially the posterior ones, very powerfully developed. Natatory legs on the whole agreeing in structure with those in *Bradyopontius*; inner ramus of 4th pair, as in that genus, distinctly 3-articulate. Last pair of legs somewhat more fully developed than in the other *Dyspontiidae*.

*Remarks*.—This genus, established by Giesbrecht, is allied to *Bradyopontius*, agreeing with it in the presence of a distinctly 3-articulate inner ramus on the 4th pair of legs. It differs however in some points rather conspicuously, both as regards the outward appearance and some of the structural details, and therefore ought evidently to be supported. We do not know at present more than a single species, to be described below.

73. **Cribropontius Normani**, (Brady).

(Pl. LXXVII).

*Artotrogus Normani*, Brady, Monograph of British Copepoda, Vol. III, p. 63, Pl. XCI, figs. 12–15, Pl. XCII, fig. 14, Pl. XCIII, fig. 10.

Syn: *Dyspontius Normani*, Brady & Roberts." *Bradyopontius Normani*, Giesbrecht.

*Specific Characters*.—*Female*. Anterior division of body moderately expanded and somewhat depressed, with the greatest width slightly exceeding  $\frac{2}{3}$  of the length. Cephalic segment large, though not occupying quite half the total length, free edge evenly curved, frontal part rounded, without any dorsal crest, postero-lateral corners divided into 2 short lappets; rostral projection well defined, incurved. Epimeral lappets of the 3 succeeding segments rather unequal, those of antepenultimate trunk-segment much the largest, and greatly projecting to each side; those of penultimate segment well developed, though smaller than the 2 preceding pairs. Tail attaining nearly half the length of the anterior division; genital segment gradually somewhat dilated anteriorly; anal segment about the



length of the 2 preceding ones combined, and conspicuously widening distally. Caudal rami rather broad, and somewhat shorter than the anal segment, with the inner edge finely ciliated, outer edge exhibiting, at some distance from the end, a distinct ledge, to which the outermost seta and the very small accompanying dorsal bristle are attached; apical setæ comparatively short, but rather coarse and densely ciliated. Anterior antennæ not nearly attaining half the length of the cephalic segment, and composed of 9 joints rather densely clothed with short, but rather coarse, curved setæ, 3rd joint much the largest, terminal joint club-shaped and about the length of the 2 preceding joints combined. Posterior antennæ with the terminal joint shorter than the penultimate one, apical setæ spiniform, the middle one, as usual, the longest. Siphon extending about midway between the insertion of the posterior maxillipeds and that of 1st pair of legs. Mandibles minutely denticulated at the apex. Maxillæ with the outer lobe scarcely half as long as the inner, apical setæ on both lobes very slender and curved. Anterior maxillipeds with the dactylus very strong and evenly curved in its distal part, terminating in a blunt point; secondary spine of moderate size. Posterior maxillipeds still more powerful than the anterior ones, with the dactylus exceedingly strongly built, its proximal joints being unusually stout, with the spines issuing inside very coarse, terminal claw occupying rather more than half the length of the dactylus. Natatory legs well developed, with the rami comparatively broad; inner ramus of 4th pair, however, considerably narrower than the outer and also somewhat shorter. Free joint of last pair of legs slightly produced, oblong quadrangular in form, and carrying at the tip one long and 2 short bristles. Ovisacs of moderate size and globular in shape.

Body of a light yellowish grey colour and ornamented with a number of very conspicuous brick-red patches, 2 median, the one occupying the front part of the cephalic segment, the other the dorsal face of the 3 succeeding segments, and 3 lateral on each side, the 2 anterior pairs occurring on the cephalic segment, the posterior pair on the projecting epimeral lappets of the 3rd segment; ova in the ovisacs of a yellowish red colour.

Length of adult female amounting to 1.70 mm

*Remarks.*—This form was at first recorded by Brady and Robertson as a species of the genus *Dyspontius*, and was subsequently by the first-named author erroneously referred to the genus *Artotrogus* of Boeck. This mistake was corrected by Giesbrecht, who found it to agree much better with the genus *Bradypontius*, to which it was indeed at first referred by that author. After having examined more closely a specimen sent to him by Scott, he felt however justified in excluding it also from this genus as the type of a new nearly-

allied genus. The present form is indeed, easily distinguishable from any of the species of that genus, and is, moreover, in the living state at once recognised by its peculiar colour, which has also been mentioned by Scott.

*Occurrence*.—I have met with this handsome form occasionally in 2 or 3 places on the west coast of Norway in depths ranging from 20 to 50 fathoms.

*Distribution*.—British Isles (Brady), Madeira (Thompson).

## Fam. 8. Artotrogidæ.

*Characters*.—Body very broad, more or less clypeiform, with the 2 posterior trunk-segments imperfectly developed. Tail quite short, and composed in female of 4, in male of 5 segments. Antennæ and oral parts on the whole built on the same type as in the *Dyspontiidæ*. Only 3 pairs of natatory legs present, the 4th pair being wholly absent. Last pair of legs not defined from the corresponding segment. Ovisacs in female more or less concealed beneath the body.

*Remarks*.—This family, as here defined, does not answer at all to the family *Artotrogidæ* of Brady, which, like the family *Asterocheridæ* of Giesbrecht, was established to include all the siphonostomous Cyclopoida. In the restriction here adopted, this family only comprises 2 genera, viz., *Artotrogus* Boeck and *Dystrogus* Giesbrecht, both of which agree in one very essential character, viz., in the total absence of the 4th pair of legs, in this respect exhibiting an approach to the next family, the *Cancerillidæ*. The exact comparison of these 2 genera is rendered somewhat difficult by the circumstance that of the one (*Artotrogus*) we only know the female sex, of the other (*Dystrogus*) only the male sex. It is evident, however, that they represent two distinct generic types.

### Gen. 33. *Artotrogus*, Boeck, 1859.

*Generic Characters*.—Body greatly expanded, rounded in form, with the epimeral lappets of the cephalic segment and the 2 anterior trunk-segments well developed, imbricate. The last 2 trunk-segments almost wholly concealed, with no epimeral lappets. Tail very short, projecting only slightly beyond the anterior

division; genital segment (in female) with a lamellar, posteriorly-pointing expansion on each side. Caudal rami short. Anterior antennæ comparatively small and resembling in structure those in the *Dyspontiidae*. Posterior antennæ still smaller, 4-articulate, with the outer ramus rudimentary. Siphon well developed and rather coarse, gradually tapered distally. Mandibles without any palp. Maxillæ with the lobes rather unequal in size. Both pairs of maxillipeds powerfully developed. Natatory legs strongly incurved, with the rami subequal in length, and on the whole built on the same type as in the *Dyspontiidae*, except that the 4th pair is wholly wanting.

*Remarks.*—This genus was established as early as the year 1859 by Boeck, to include a peculiar Copepod found by him on the south coast of Norway. As only a solitary specimen was observed by that author, the generic characters were not made out satisfactorily, and several errors were indeed introduced, which however have partly been corrected by subsequent authors. The genus comprises as yet only a single species, to be described below.

#### 74. *Artotrogus orbicularis*, Boeck.

(Pl. LXXVIII).

*Artotrogus orbicularis*, Boeck. Tvende nye parasitiske Krebsdyr; Chr. Vid. Selsk. Forhandl. f. 1859, p. 171, Pl. I, figs. 1—10.

*Specific Characters.*—*Female.* Body pronouncedly clypeiform, and nearly orbicular in outline, with the dorsal face evenly vaulted, the ventral flattened or concaved. Cephalic segment very large, occupying rather more than half the total length, and having the free edges evenly arched; postero-lateral corners triangularly produced and curved backwards; frontal part scarcely prominent and without any dorsal crest; rostral prominence imperfectly defined and blunted at the end. Epimeral lappets of the 2 succeeding segments large and recurved. Tail extremely short, being almost wholly received within the deep emargination formed behind between the epimeral lappets of the 2nd free trunk-segment; genital segment sub-quadrate in form, and produced on each side behind to a narrow lamella flanking the 2 succeeding very short segments; anal segment larger than those segments combined and somewhat widening distally. Caudal rami scarcely longer than they are broad, and rather wide apart, outermost seta at some distance from the end and about the length of the innermost; the 2 middle setæ not much produced. Anterior antennæ scarcely attaining in length  $\frac{1}{3}$  of the cephalic segment, and composed of 9 joints clothed with moderately long setæ, 1st and 3rd joints the longest; terminal joint club-shaped and about the length of the 2 preceding ones combined; the æsthetask, attached to this

joint, at some distance from the end, of moderate length. Posterior antennæ with the outer ramus very small and provided with only a single minute bristle; terminal joint longer than the penultimate one and somewhat curved in its outer part, seta of outer edge attached at a short distance from the end. Siphon extending only slightly beyond the insertion of the posterior maxillipeds. Maxillæ with the outer lobe scarcely half as long as the inner; apical setæ of both lobes rather slender. Anterior maxillipeds with the dactylus exceedingly strong and hamiformly curved at the end; secondary spine small. Posterior maxillipeds more normally developed, terminal claw of the dactylus occupying about half its length, and finely denticulate inside. 1st pair of natatory legs somewhat smaller than the 2 succeeding ones, and having the terminal joint of outer ramus of moderate size and provided outside with 3 spines and inside with 3 setæ. Inner ramus of 3rd pair differing from that of 2nd pair in the absence of the usual apical spine. Not even the slightest rudiment of a 4th pair present. Last pair of legs only represented by 3 small bristles, all issuing immediately from the sides of the corresponding segment. Lateral cœca of intestine very fully developed, extending along the sides of the cephalic segment and also penetrating into the adjacent part of the trunk, being divided outside into numerous narrow lobules. Ovisacs globular in form and wholly concealed beneath the posterior part of the trunk.

Body of a light yellowish brown colour, with the intestine and its lateral cœca of a darker hue; ova in the ovisacs orange-coloured.

Length of adult female about 2 mm.

*Male* (at least in its adult state) unknown.<sup>1)</sup>

*Remarks.*—The present Copepod cannot be confounded with any of the other siphonostomous Cyclopoida, being clearly distinguished by the pronouncedly clypeiform shape of the body and its nearly circular form. It is however not improbable that the hitherto unknown female of *Dystrogus* will be found to approach nearer to *Artotrogus* in the general form of the body than does the male.

*Occurrence.*—This peculiar form was observed by my late father at a very early period, at Manger, north of Bergen, where several specimens were taken by him from nudibranchiate Mollusca. The specimen described by Bock was found by him on a species of *Doris* taken at Farsund, south coast of Norway. I have myself met with this form in two widely distant localities of the Norwegian coast, viz., at Kleven, near Mandal, and at Hasvig, western Finmark. In both

<sup>1)</sup> It is very questionable if the specimen described by Scott as the male of the present form was in reality of that sex, and I think that Giesbrecht was right in believing it to be quite an immature form, in which the sexual characters had not yet appeared.



localities the specimens were taken in the free state among algæ and other marine growths.

*Distribution.*—British Isles (Scott), Kara Sea (Hansen), Ceylon (A. Scott).

## Fam. 9. Cancerillidæ.

*Characters.*—Body of rather different shape in the different genera, but scarcely clypeiform. The 2 or 3 posterior trunk-segments imperfectly developed, without any epimeral plates. Tail short or moderately produced, with a somewhat varying number of segments. Anterior antennæ normal. Posterior antennæ, however, very unlike those in the preceding families, being transformed into strong prehensile organs terminating in a powerful curved claw. Siphon imperfectly developed, in some cases obsolete. Mandibles short, mucroniform, extending straight inwards, palp absent. Maxillæ likewise incurved and terminating in one or 2 setiferous lobes. Maxillipeds on the whole built in the usual manner; though attached at a somewhat greater distance from the median line than in the other families. Some of the posterior pairs of legs imperfectly developed or quite wanting, this imperfect development in some cases even extending to all the legs (in female).

*Remarks.*—This family answers to the subfamily *Cancerillinæ* of Giesbrecht, and contains as yet only 2 genera, to be treated of below. These genera, it is true, differ considerably, both as to the outward appearance of the body and to some of the structural details, but yet exhibit some well-marked features in common, the most essential of which are the prehensile character of the posterior antennæ, and the imperfect development of the siphon and of some of the legs.

### Gen. 34. *Parartotrogus*, Scott. 1893.

*Generic Characters.*—General form of body not deviating much from the usual type, the anterior division being moderately dilated and somewhat flattened. Cephalic segment more or less expanded in the middle, with the frontal part somewhat produced, but without any true rostrum; postero-lateral corners not produced. The 2 succeeding segments well developed, with rounded epimeral

plates; the 2 posterior trunk-segments, however, very small and not produced at all laterally. Tail normally developed, and composed in female of 4, in male of 5 segments. Caudal rami comparatively small. Anterior antennæ resembling in structure those in *Artotrogus*, though somewhat coarser; those in male (according to Scott) distinctly hinged, but without supplementary æsthetascs. Posterior antennæ very powerfully developed and strongly clawed at the end, outer ramus present as a delicate setiferous lamella. Siphon obsolete, the 2 lips being scarcely at all produced. Mandibles terminating in a simple point. Maxillæ with 2 very unequal lobes. Maxillipeds comparatively slender, and of quite normal structure. Only 3 pairs of natatory legs present, 1st pair with both rami only composed of 2 joints. 4th pair of legs wanting, or only present as a very slight rudiment. Last pair of legs represented by a small bisetose joint accompanied outside by the usual bristle.

*Remarks.*—This genus was established in the year 1893 by Scott, to include a peculiar Copepod, *P. Richardi*, found by him on the Scottish coast; and subsequently also observed by Giesbrecht. The generic name proposed by Scott is somewhat inappropriate, as the affinity of this genus to *Artotrogus* is a very remote one. The genus comprises as yet 2 nearly-allied species, one of which will be described below.

#### 75. *Parartotrogus arcticus*, Scott.

(Pl. LXXIX).

*Parartotrogus Richardi*, var. *arctica*. Scott, On some Eutomostraca collected in the Arctic Seas; Ann. Mag. Nat. Hist., Ser. 7. Vol. VIII, p. 352, Pl. VI.

*Specific Characters.*—*Female.* Body comparatively more slender than in the type species, with the anterior division less dilated, and oval in outline. Cephalic segment very large, occupying about half the total length, but not nearly so much expanded in the middle as in *P. Richardi*, the lateral edges being evenly arcuate; frontal part conspicuously exerted and broadly truncated at the end. Epimeral plates of the 2 succeeding segments well defined and rounded at the end. The last 2 trunk-segments abruptly much narrower and subequal in size. Tail about equalling in length half the anterior division; genital segment fully as long as the 3 succeeding segments combined, and gradually widening anteriorly, forming on each side in front a somewhat projecting angle; anal segment longer than the preceding one. Caudal rami somewhat longer than they are broad and rather far apart, apical setæ comparatively short, the inner mediate one scarcely exceeding half the length of the tail. Anterior antennæ not quite attaining half the length of the cephalic segment, and somewhat bent at the base,

being composed of 9 joints rather densely clothed with short curved setæ; 2nd joint the largest and rather broad at the base; terminal joint nearly as long as the 2 preceding ones combined, and carrying at some distance from the end the usual æsthetask. Posterior antennæ exceedingly powerful and exhibiting a somewhat sigmoid curvature, penultimate joint much the largest, terminal joint short and thick, carrying on the end a very strong curved claw accompanied inside by another much smaller claw; outer ramus forming a narrow, lancet-shaped lamella attached near the end of the 2nd (basal) joint, and provided with 3 small bristles. Mandibles comparatively short, and terminating in a simple point. Maxillæ with the outer lobe very small and provided at the tip with 3 comparatively short subequal setæ; inner lobe widening considerably distally, spatulate in form, and carrying on the transversely truncated extremity 3 ciliated spines and 2 abruptly recurved slender and densely ciliated setæ. Anterior maxillipeds with the dactylus rather slender, biarticulate, and provided beyond the middle with a small secondary spine, tip sharply pointed. Posterior maxillipeds with the hand somewhat fusiform, and provided at about the middle of the inner edge with a ciliated seta; dactylus slender, triarticulate, with no spine inside the 1st joint, terminal claw occupying about half the length of the dactylus. 1st pair of legs with no seta inside the proximal joint of the outer ramus, distal joint of this ramus with 3 very slender spines outside; distal joint of inner ramus rather large, with 7 setæ, one of which issues from the outer edge. The 2 succeeding pairs of legs with both rami distinctly 3-articulate and rather slender, spines of outer ramus dagger-shaped; inner ramus with the terminal joint produced at the end into 2 dentiform projections, between which in the 2nd pair 2 subequal setæ are affixed, in the 3rd pair only a single dagger-like spine; number of setæ on the inner ramus of the latter pair somewhat reduced, the middle joint having only a single seta and the terminal joint 2 setæ inside. 4th pair of legs present as a small bisetose joint attached to each side of the corresponding segment and accompanied outside by a small bristle. Free joint of last pair of legs of somewhat larger size and provided with 3 setæ, 2 apical and one lateral.

*Male* (according to Scott) very like the female in its outward appearance, but of smaller size.

Colour in female pale yellow, with darker translucent ovarial tubes and with some slight ochraceous pigmentary patches on each side of the cephalic segment and trunk; eye bright red and occurring unusually far back.

Length of adult female 0.80 mm.

*Remarks.*—This form is closely allied to the type species, *P. Richardi* Scott, and was indeed regarded by that author as merely a variety of this species.

It ought, evidently however, in my opinion to be considered as specifically distinct, as it differs conspicuously not only in the more slender form of the body and the far less expanded cephalic segment, but also in some of the structural details. Thus the inner ramus of the 3rd pair of legs is distinctly 3-articulate, whereas in the type species it is composed of only 2 joints; and the 4th pair of legs, which in *P. Richardi* is wholly absent, is represented by a well-marked, though very small rudiment. Finally, the distal joint of the inner ramus in the 1st pair of legs has 2 setæ more than in *P. Richardi*.

*Occurrence*.—Two or three female specimens of this form were collected, many years ago, at Kvalø, on the Nordland coast, from a depth of 40–50 fathoms.

*Distribution*.—Arctic Sea, off Spitsbergen and Novaja Zemlia (Scott).

### Gen. 35. **Cancerilla**, Dalyell, 1851.

Syn: *Caligillum*, Claus (male).

*Generic Characters*.—Form of body very dissimilar in the two sexes, being exceedingly short and stout in female, in male much more slender. Cephalic segment in female greatly inflated, in male sub-depressed; rostral projection in both sexes obsolete. The succeeding segment well marked, with the epimeral parts less distinctly defined in female than in male; the 3 remaining trunk-segments in both sexes imperfectly developed, without any epimeral plates. Tail in female very short and composed of only 3 segments, in male more produced and 5 articulate. Caudal rami smaller in female than in male. Anterior antennæ in female comparatively short, with the number of joints considerably reduced; those in male not at all binged, but of larger size and composed of a greater number of joints, being moreover provided with numerous recurved sensory filaments. Posterior antennæ in both sexes distinctly prehensile, terminating in a strong claw, outer ramus absent. Siphon faintly indicated by a slight prolongation of the lips, and turned anteriorly. Mandibles with the extremity slightly dilated and indistinctly denticulated. Maxillæ with only a single lobe turned inwards. Both pairs of maxillipeds short and stout, especially in female. 4th pair of legs absent in both sexes. All the remaining legs in female reduced, and unfit for swimming; the 2 anterior pairs in male natatory, 1st pair smaller and less perfectly developed than 2nd, which are quite normal, with both rami 3-articulate. Last pair of legs in both sexes small, unarticulate.



*Remarks.*—This genus was established as early as the year 1851 by the English naturalist Dalyell, to include a peculiar parasite found by him on a species of brittle-stars. The systematic position of the genus has long remained very uncertain; but Giesbrecht clearly pointed out its near relationship to the siphonostomous Cyclopoidæ (Asterocheridæ) and particularly to the genus *Parartotrogus* of Scott. I also fully agree with Giesbrecht, that the genus *Caligidium* of Claus ought to be regarded as a synonym, being founded on adult males belonging to this genus.

### 76. *Cancerilla tubulata*, Dalyell.

(Pl. LXXX).

*Cancerilla tubulata*, Dalyell, The powers of the Creator, Vol. 1, p. 233, Pl. LXII, figs. 1–5.

Syn: *Caligidium vagabundum*, Claus. (adult male).

*Specific Characters.*—*Female.* Body very short and stout, almost cordiform in shape, with the anterior division greatly inflated, transversely ellipsoid in outline, the width considerably exceeding the length. Cephalic segment occupying by far the greater part of the body, free edges strongly curved and minutely hairy in their anterior part, front very slightly produced. The succeeding segment with the epimeral parts less distinctly defined, forming part of the hind boundary of the anterior division; the remaining trunk-segments imperfectly developed and only visible as narrow stripes. Tail very short, with the genital segment exceedingly dilated, being nearly 3 times as broad as it is long, and projecting behind on each side in an angular corner; anal segment larger than the preceding segment, and somewhat contracted distally. Caudal rami comparatively small and rather far apart, apical setæ short, the inner mediate one being, as usual, the longest. Anterior antennæ comparatively small and composed of only 6 joints clothed with short curved setæ; 1st joint much the largest and rather broad; terminal joint about the length of the 2 preceding ones combined, and carrying near the end a comparatively small æsthetask in addition to the setæ. Posterior antennæ very strong and highly chitinized; 1st joint rather short, the 2 succeeding ones of about equal size, terminal joint somewhat shorter, but conspicuously widening distally, apical claw exceedingly strong and curved. Maxillæ with the terminal lobe oblong in form and provided with 3 spreading non-ciliated setæ of moderate length and accompanied by a small bristle. Both pairs of maxillipeds short and stout, with the dactyli not much produced, but rather coarse. 1st pair of legs consisting each of a thickish basal part carrying outside a small bristle, and 2 unarticulate rami, the outer one lamelliform and edged with 6 comparatively short simple setæ, one inside, 2 at the tip, and 3 outside;

inner ramus very small, cylindric in form, and carrying 2 minute setæ on the tip. 2nd pair of legs much smaller than the 1st and farther from the median line, basal part less perfectly defined, though carrying outside the usual bristle; outer ramus represented by a narrow oblong joint edged outside with 6 very minute and somewhat unequal bristles; inner ramus reduced to a minute conical process. 3rd pair of legs extremely small and rudimentary, being only represented by a minute bisetose joint, without any accompanying bristle outside. 5th pair of legs likewise uniaarticulate, but slightly larger than 3rd, and accompanied outside by the usual bristle. Ovisacs globular, projecting on each side, and rather large, in some cases almost attaining the size of the whole body.

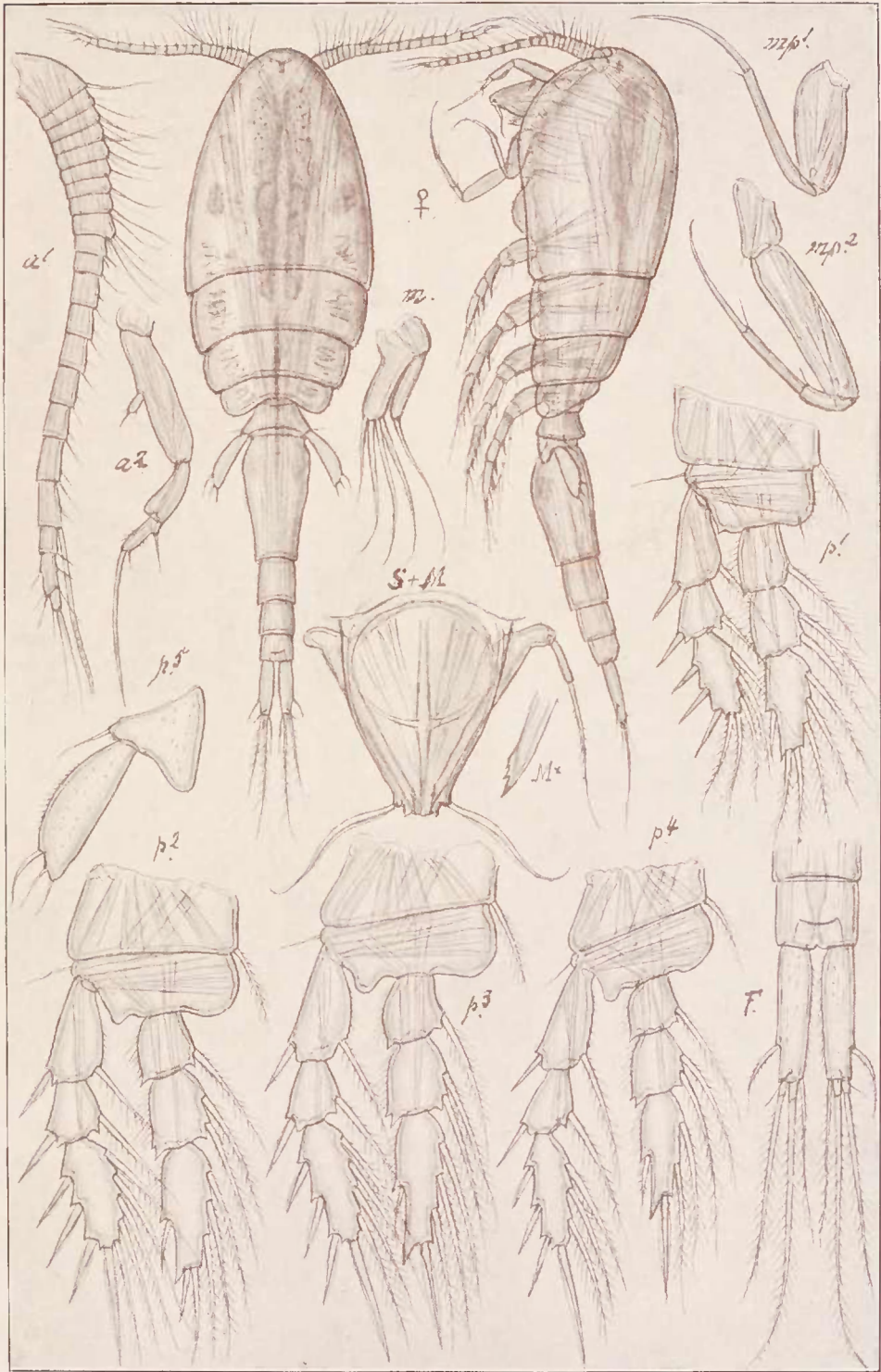
*Male* very unlike the female in its outward appearance, and of much more slender form of body. Cephalic segment occupying about half the total length, and oval in outline, being scarcely as broad as it is long, lateral edges evenly caved, frontal part obtusely truncated. 2nd segment normally developed, with the epimeral plates well defined and triangularly pointed behind. The 3 succeeding trunk-segments very small and narrow, not being at all expanded laterally. Tail nearly half as long as the anterior division and composed of 5 well-defined segments, the 1st of which (the genital segment) is much the largest and almost quadrate in outline, containing, as a rule, on each side a rounded spermatophore; anal segment somewhat larger than the preceding one. Caudal rami considerably more produced than in female, being more than twice as long as they are broad, and slightly tapered distally; inner mediate seta very long, attaining almost half the length of the body; the other setæ comparatively short. Anterior antennæ much larger than in the female and composed of 10 well defined joints, being not at all hinged, but provided with numerous delicate sensory filaments curving backwards and especially densely crowded on the 1st very large joint. Posterior antennæ of exactly the same structure as in the female, though somewhat less strong. Oral parts likewise very similar, except that the maxillipeds are a little less robust. Legs, however, rather dissimilar, the 2 anterior pairs being much more fully developed and adapted for swimming. 1st pair of legs with the basal part of normal appearance, and distinctly biarticulate; outer ramus resembling in shape and armature that in female, but comparatively larger and having the marginal setæ distinctly ciliated; inner ramus distinctly biarticulate and nearly as long as the outer, proximal joint small, with a single seta inside, distal joint oblong oval, and edged with 5 ciliated setæ. 2nd pair of legs quite normally developed, with both rami 3-articulate and armed in the usual manner with spines and setæ. 3rd pair of legs exhibiting exactly the same rudimentary condition as in the female. Last pair of legs with the free joint

# Copepoda

Ascomyzontidæ.

Cyclopoida.

Pl. LXV.



G. O. Sars, del.

*Leptomyzon elegans*, (A. Scott).



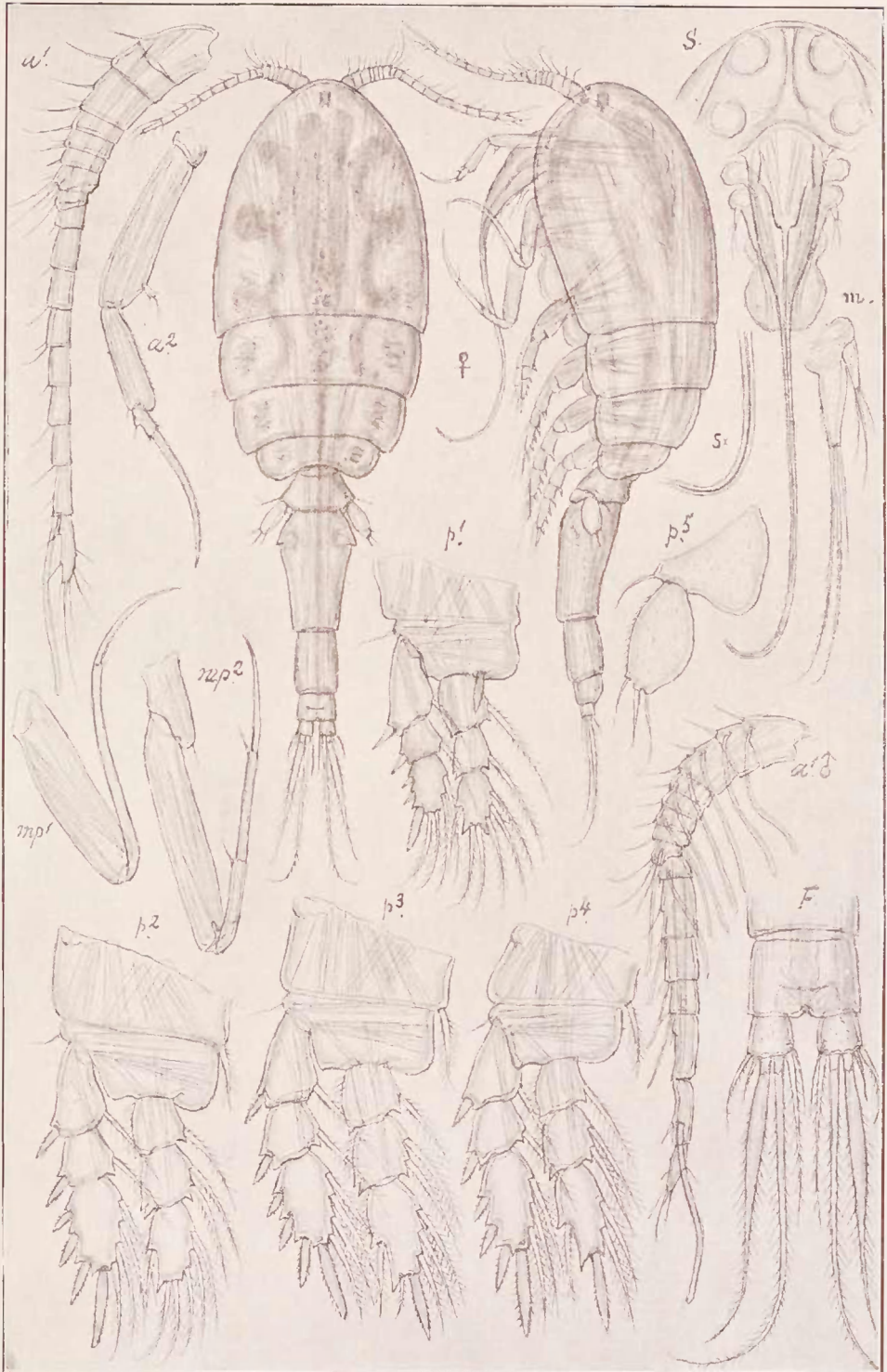


# Copepoda

Ascomyzontidæ.

Cyclopoida.

Pl. LXVI.



G. O. Sars, del.

*Scottocheres elongatus*, Scott.

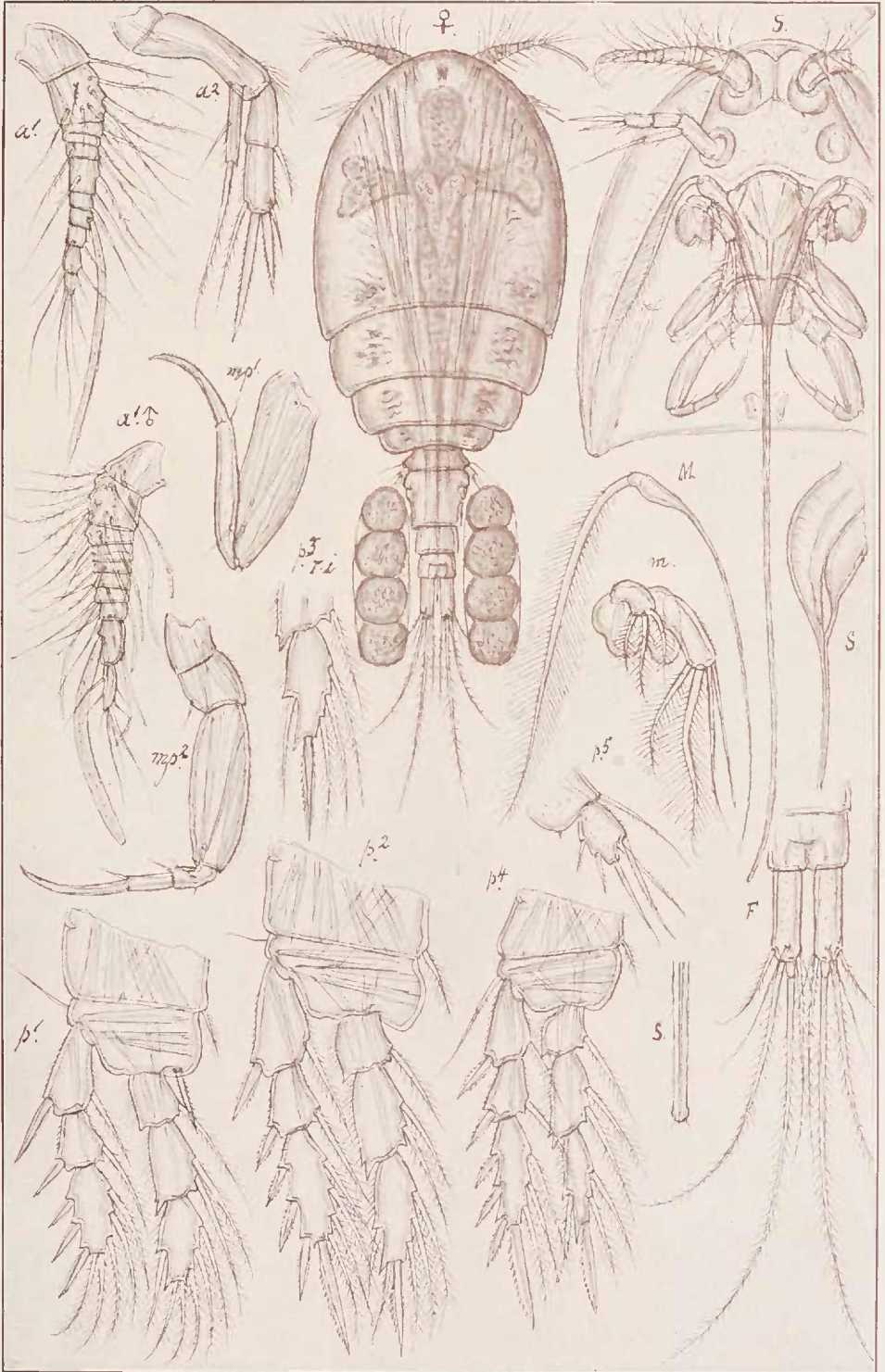


# Copepoda

Acontiophoridæ.

Cyclopoida.

Pl. LXVII



G. O. Sars, del.

*Acontiophorus scutatus*, Brady.



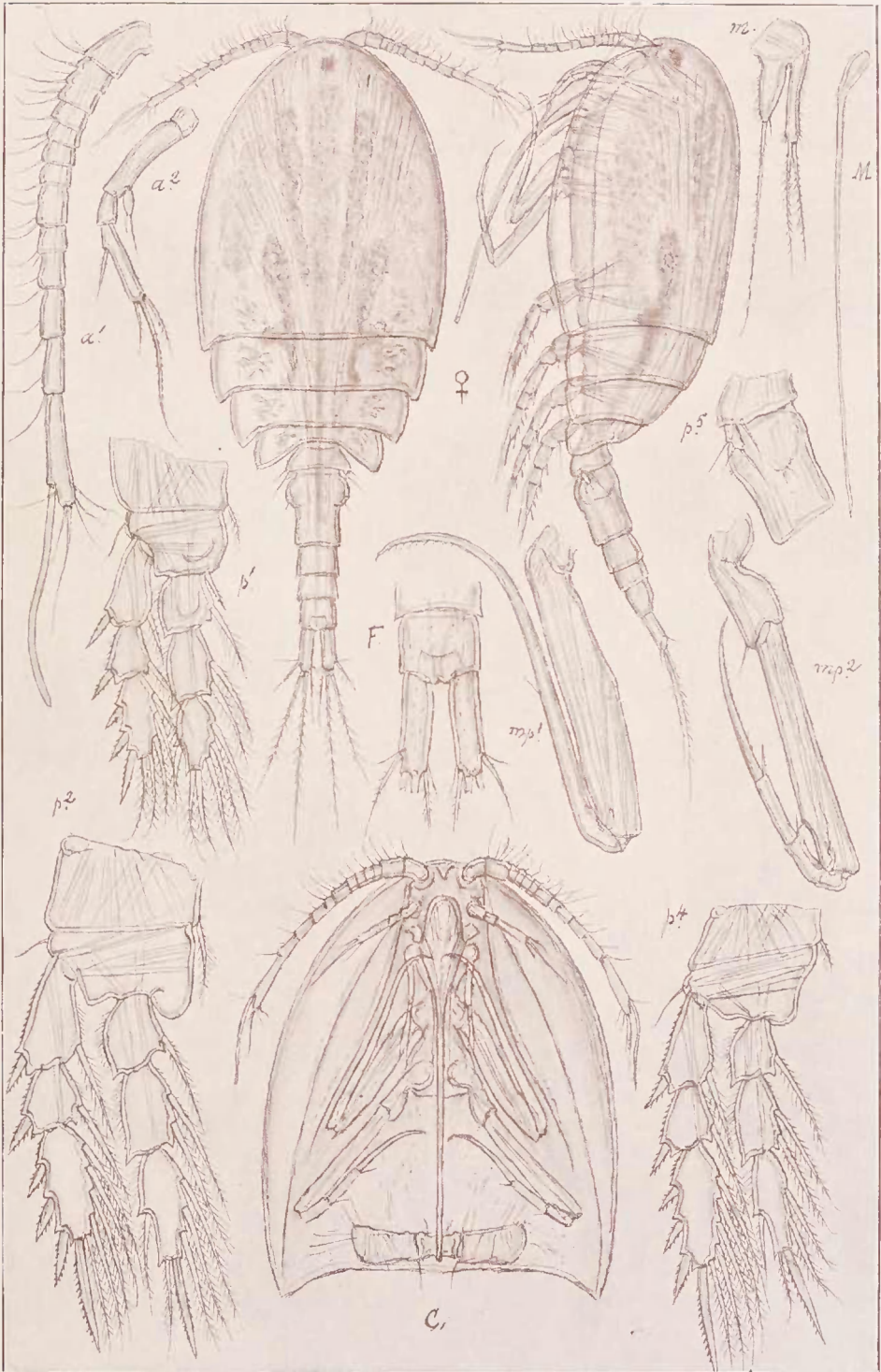


# Copepoda

Myzopontiidae.

Cyclopoida.

Pl. LXVIII



G. O. Sars. del.

*Myzopontius pungens*, Gsbr.

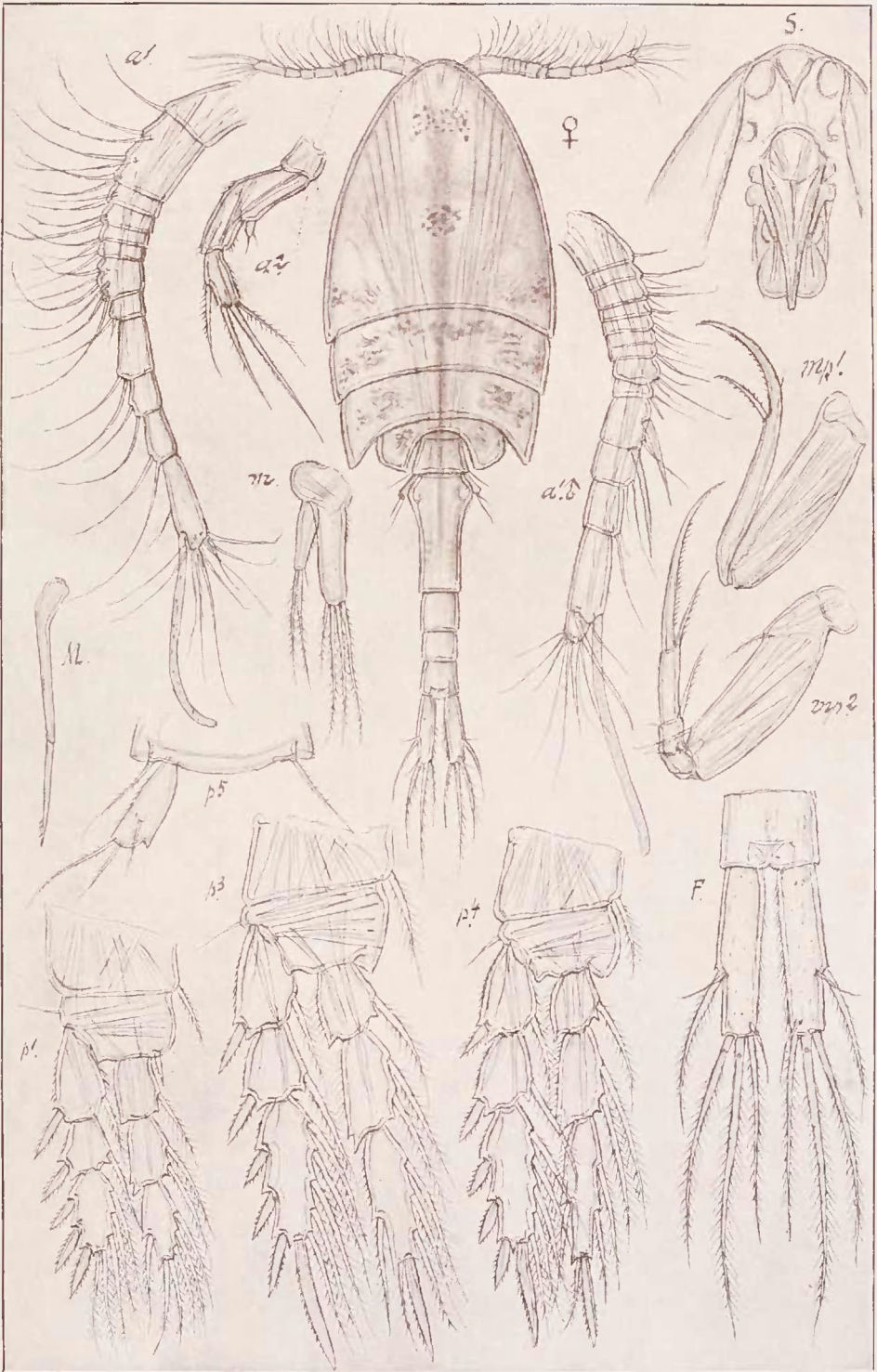


# Copepoda

Myzopontiidæ.

Cyclopoida.

Pl. LXIX.



G. O. Sars, del.

*Neopontius angularis*, Scott.



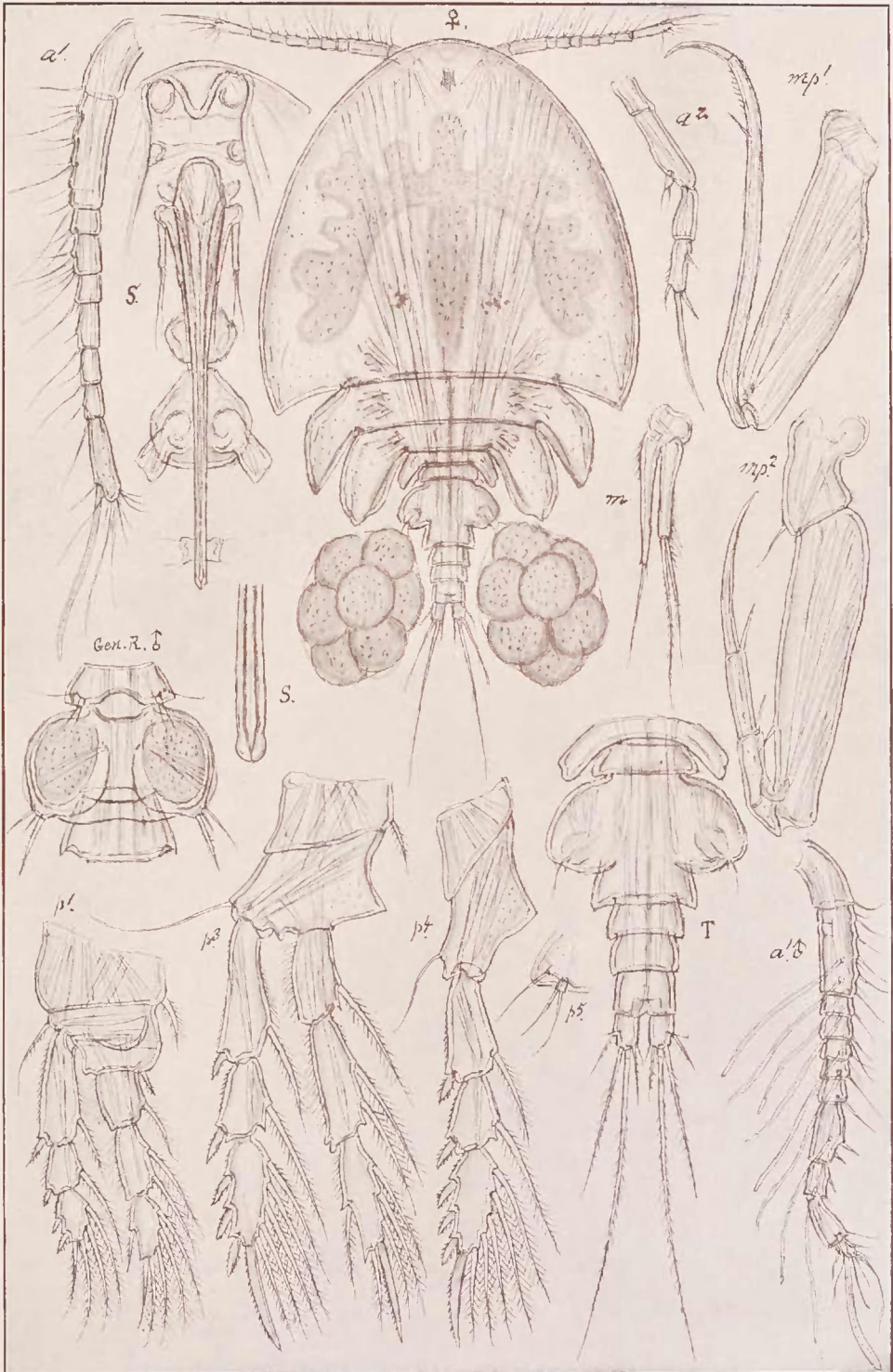


# Copepoda

Dyspontiidae.

Cyclopoida.

Pl. LXX.



G. O. Sars, del.

*Dyspontius striatus*, Thorell.

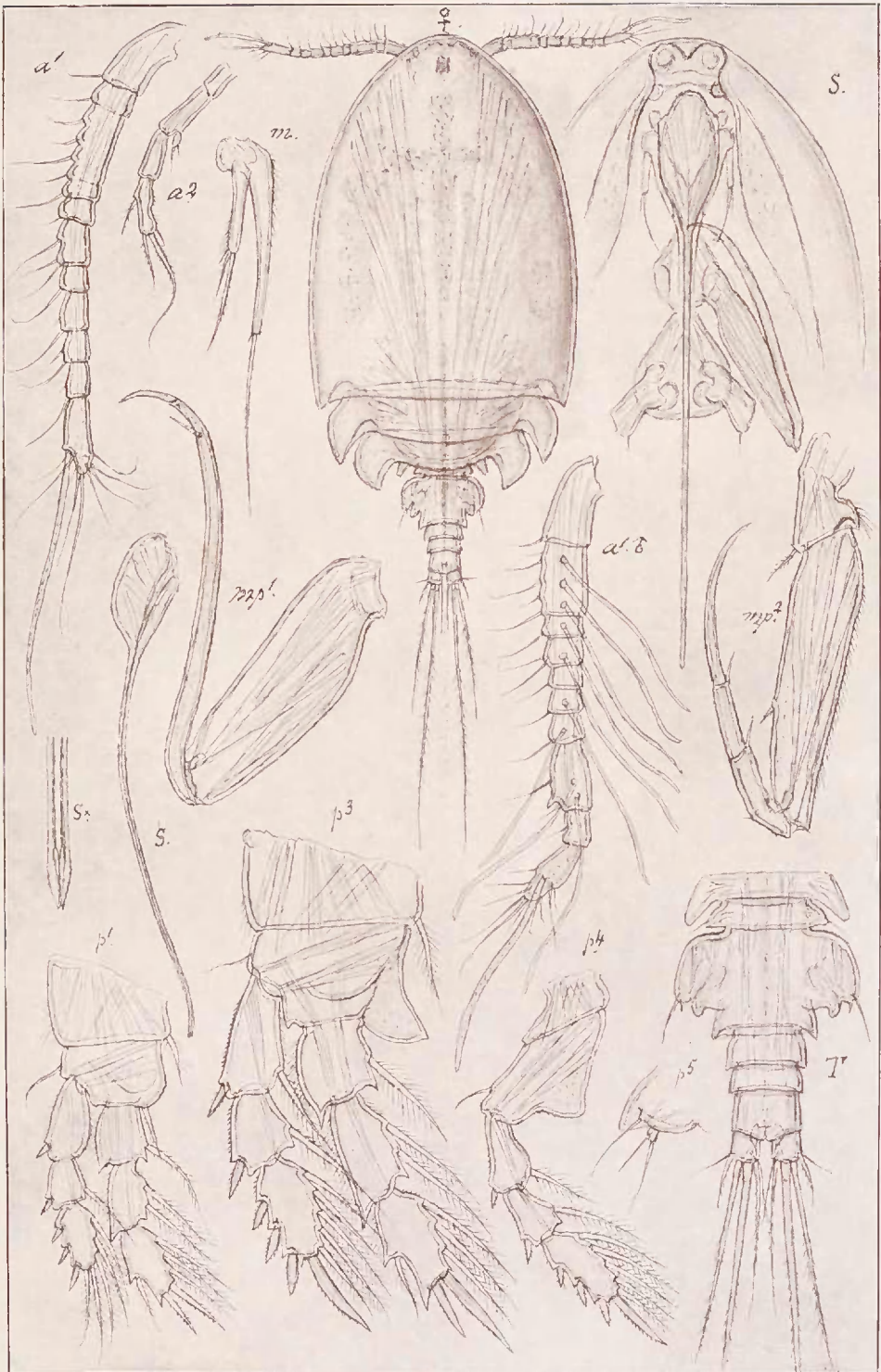


# Copepoda

Dyspontiidae

Cyclopoida.

Pl. LXXI.



G. O. Sars, del.

*Cryptopontius brevifureatus*, Gsbr.



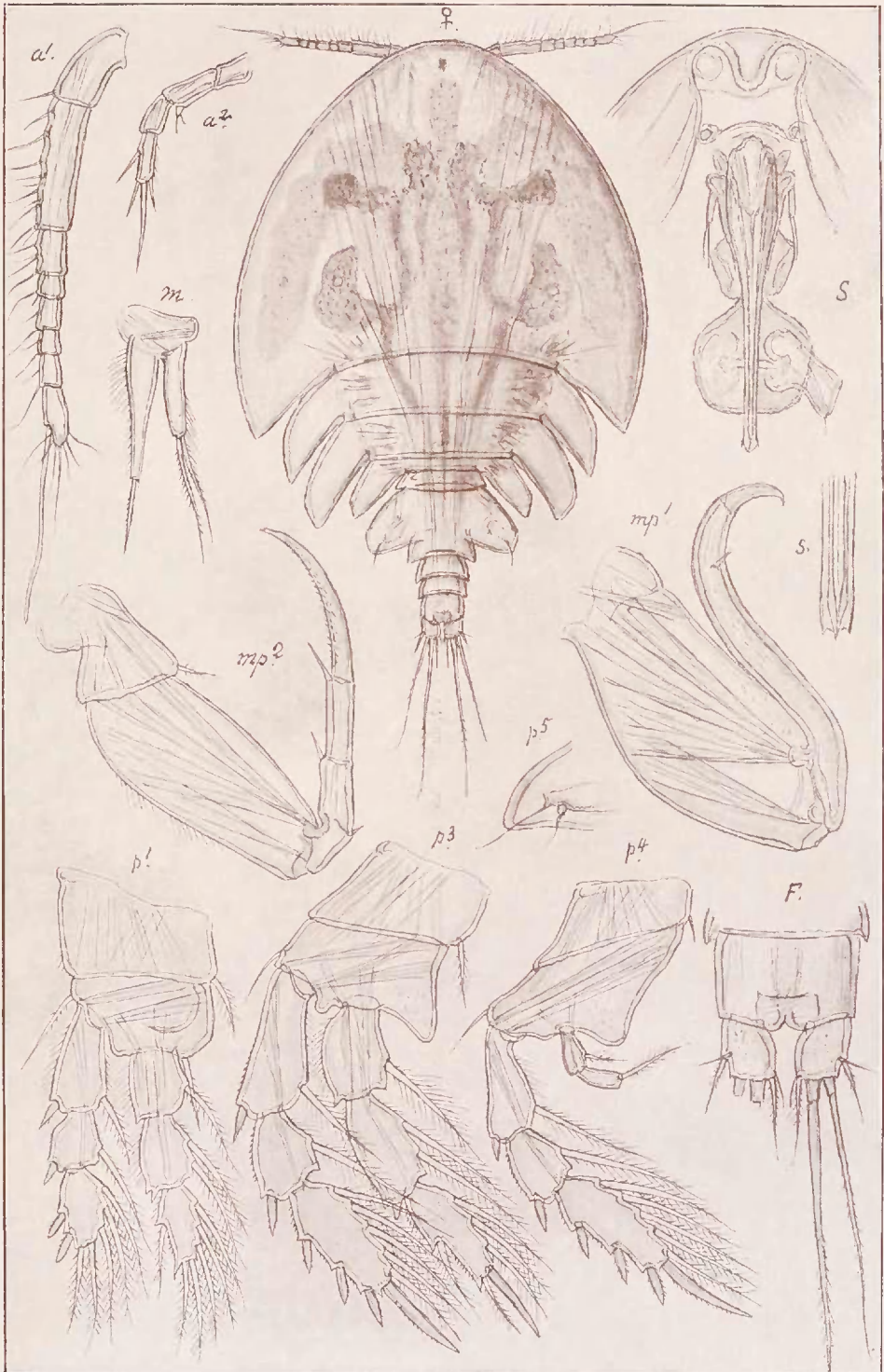


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXII.



G. O. Sars, del.

*Arctopontius expansus*, G. O. Sars.

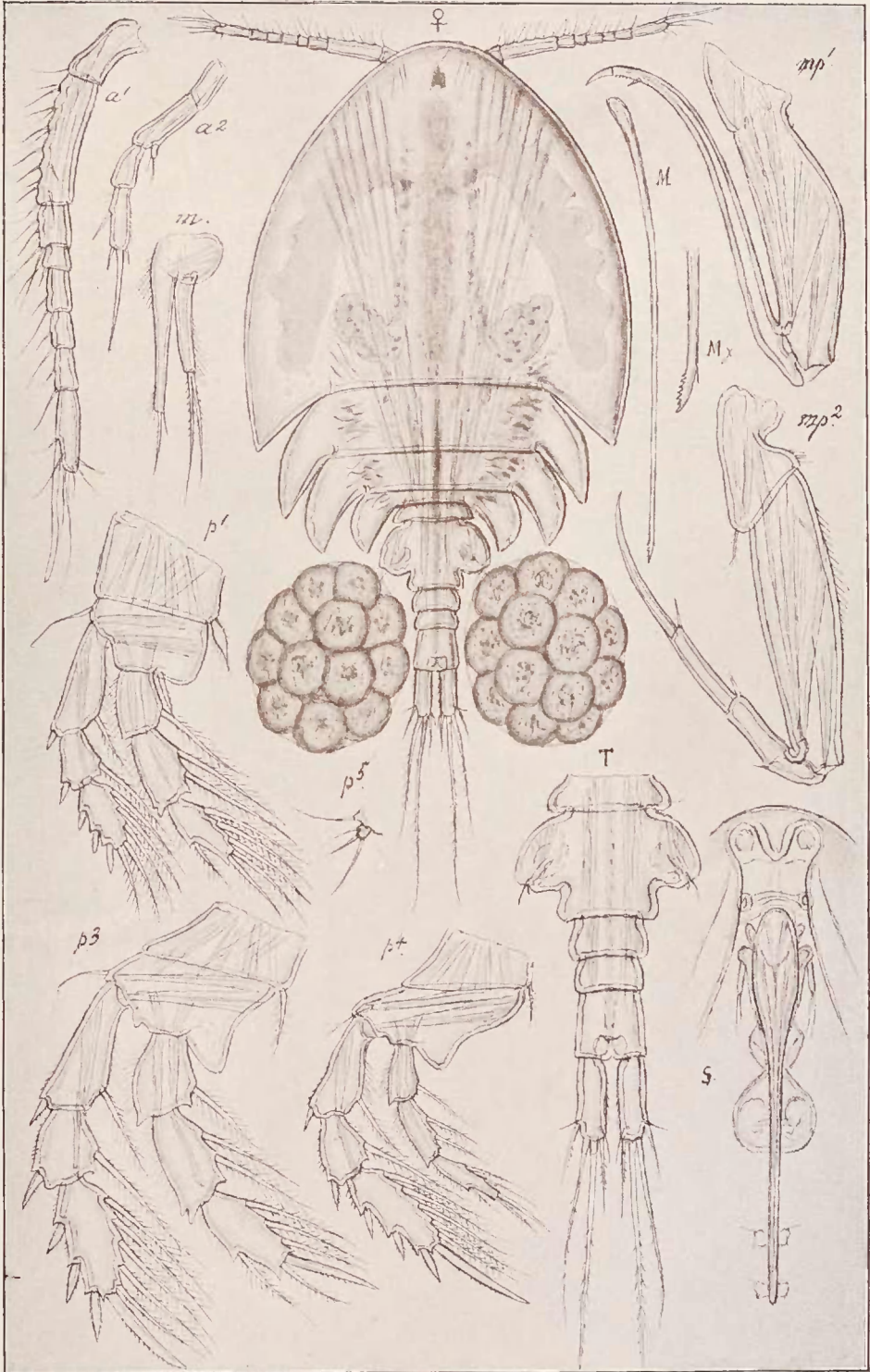


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXIII.



G. O. Sars, del.

*Bradypontius magniceps* (Brady).



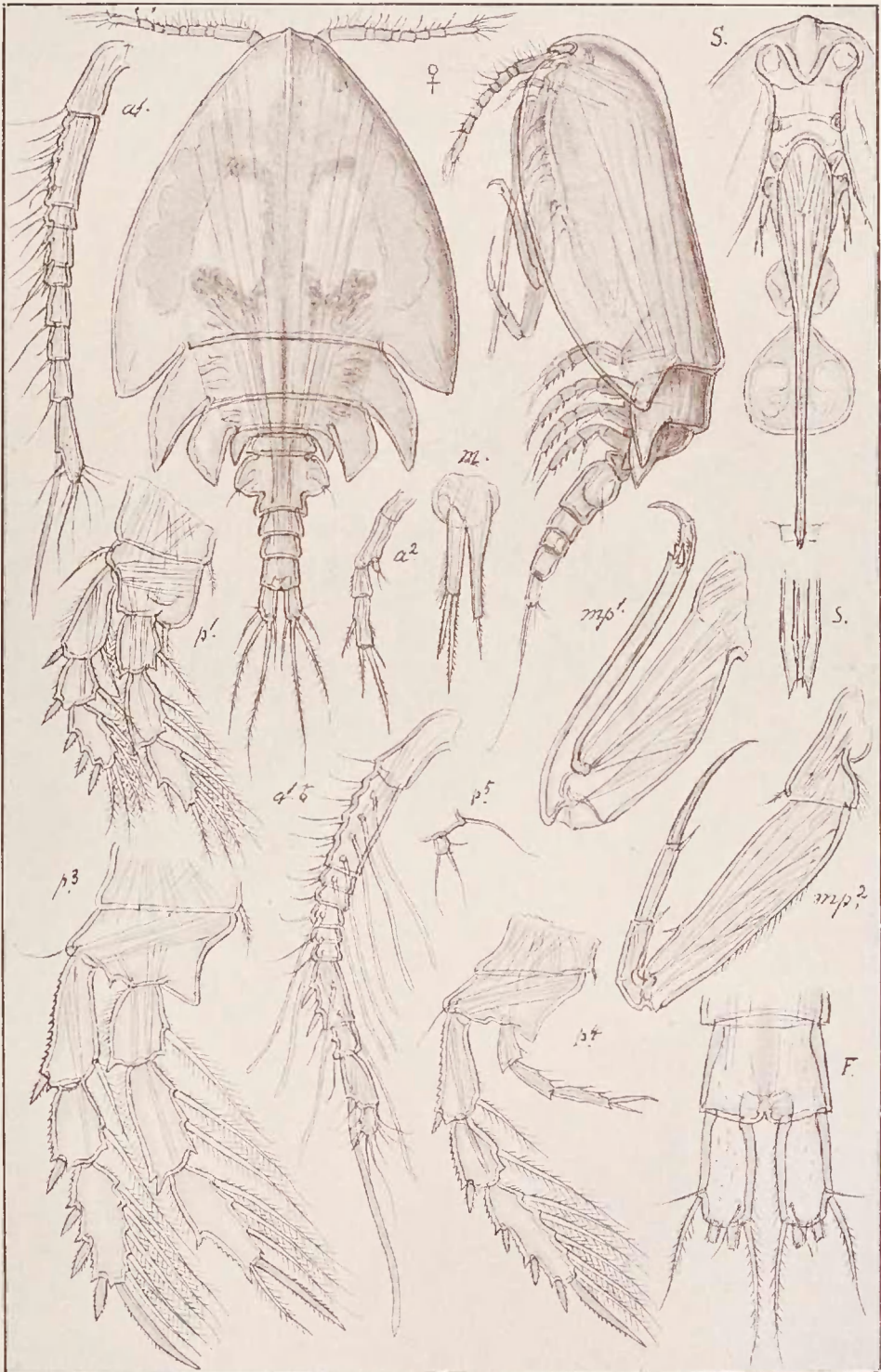


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXIV.



G. O. Sars, del.

*Bradypontius papillatus* (Scott).

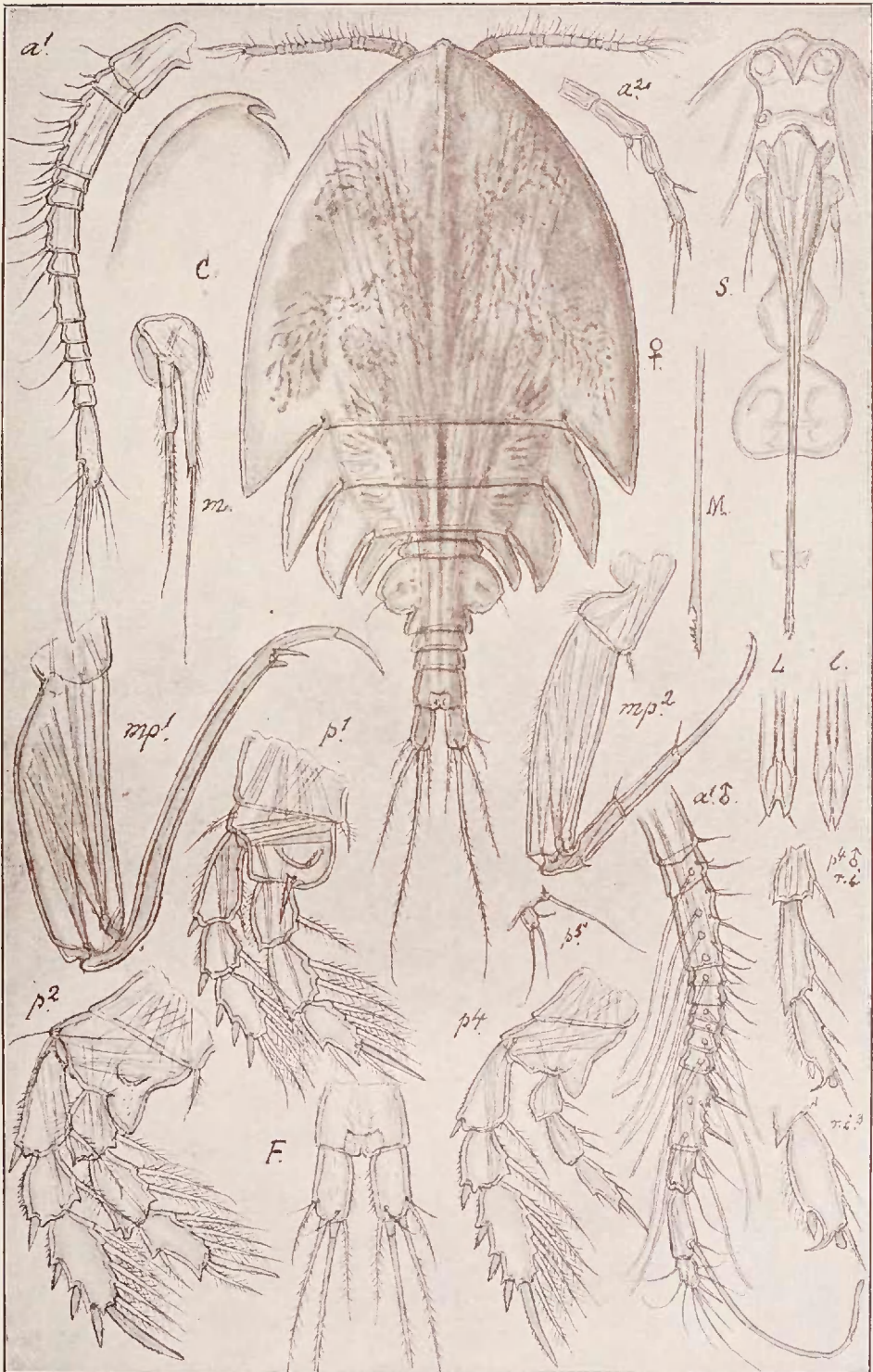


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXV.



G. O. Sars, del.

*Bradypontius major*, G. O. Sars, n. sp.



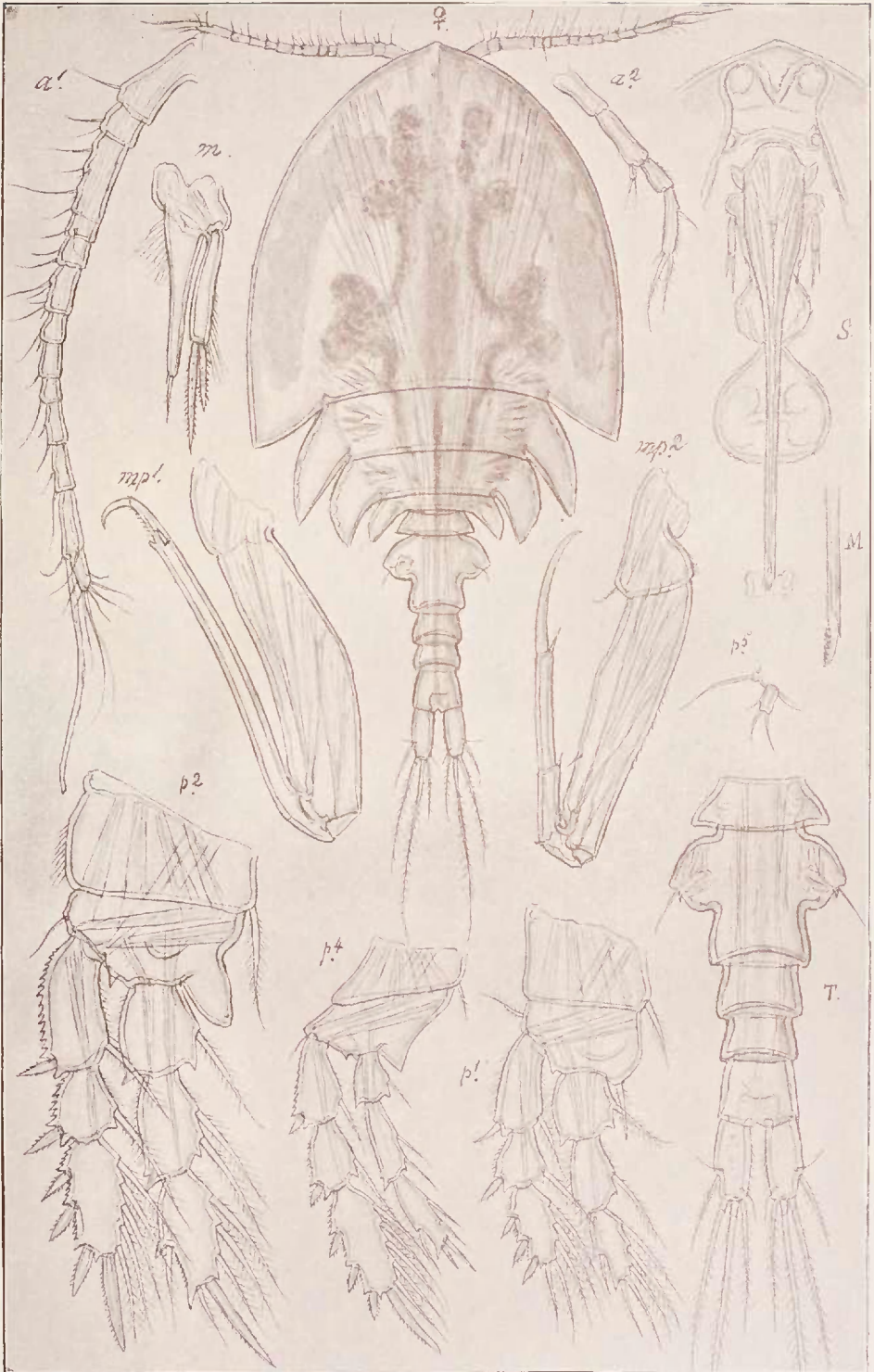


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXVI.



G. O. Sars, del.

*Bradyopontius caudatus*, G. O. Sars, n. sp.

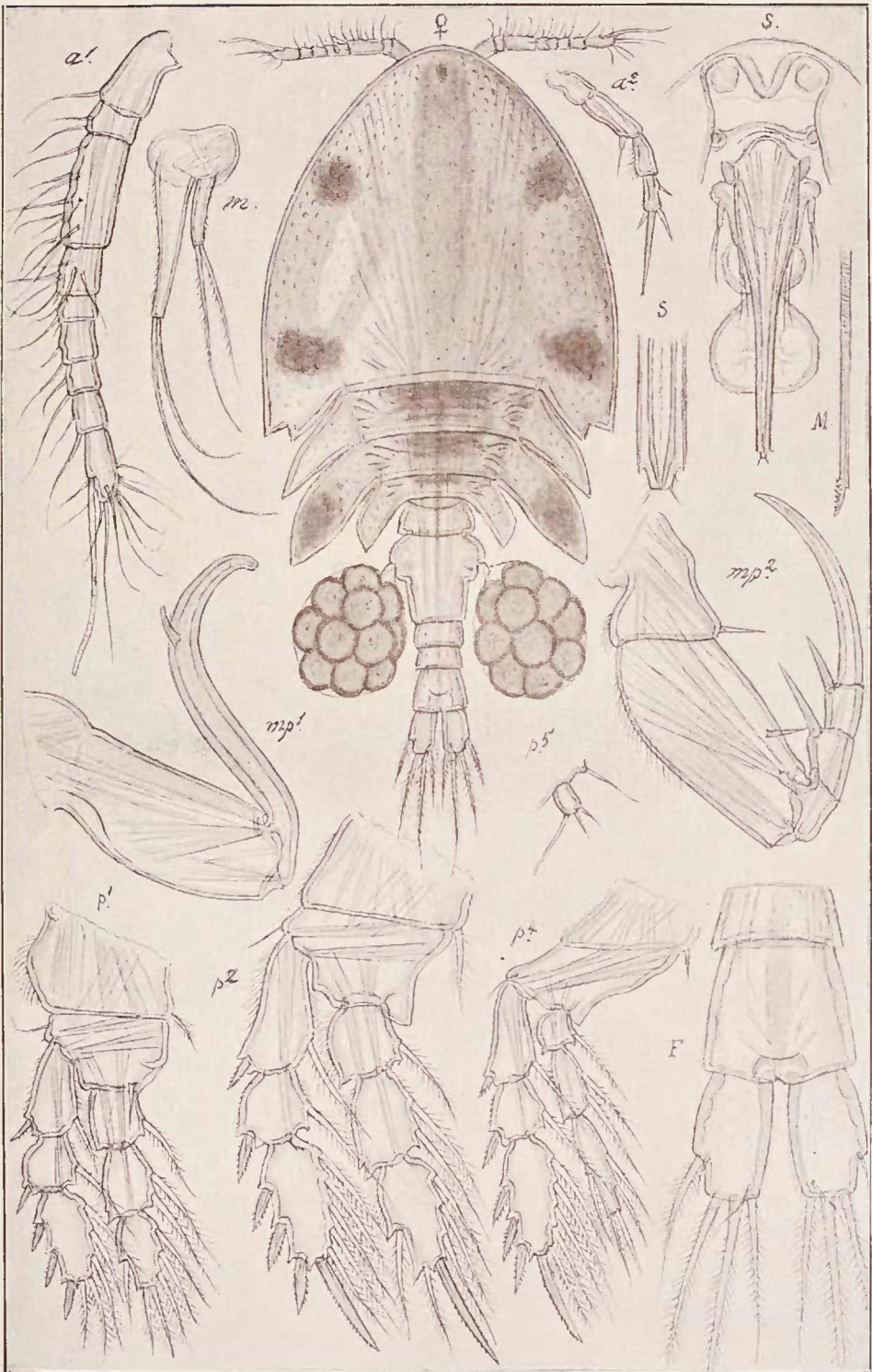


# Copepoda

Dyspontiidæ.

Cyclopoida.

Pl. LXXVII.



G. O. Sars, del.

*Cribropontius Normani* (Brady).



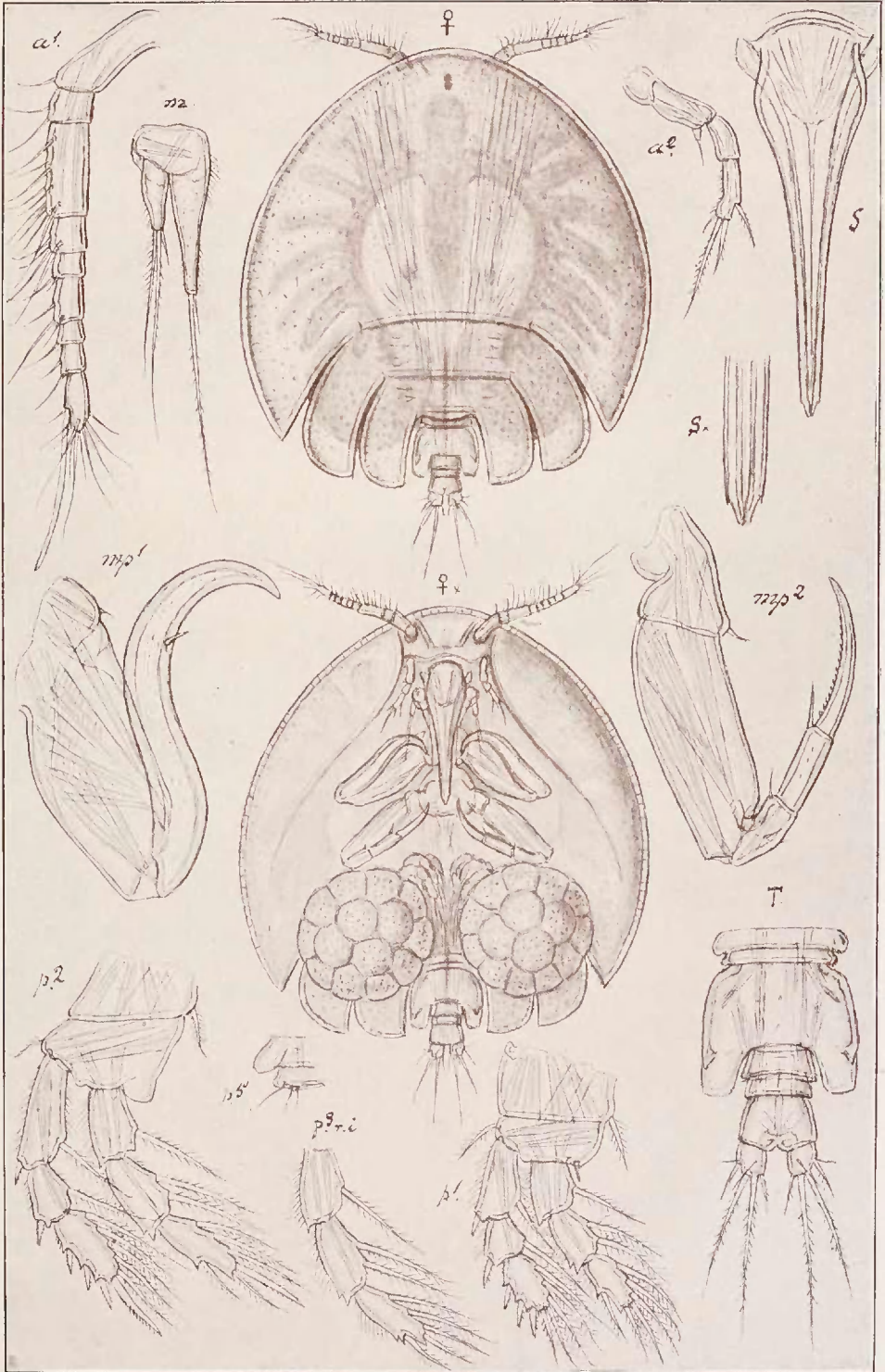


# Copepoda

Artotrogidæ.

Cyclopoida.

Pl. LXXVIII.



G. O. Sars, del.

*Artotrogus orbicularis*, Boeck.

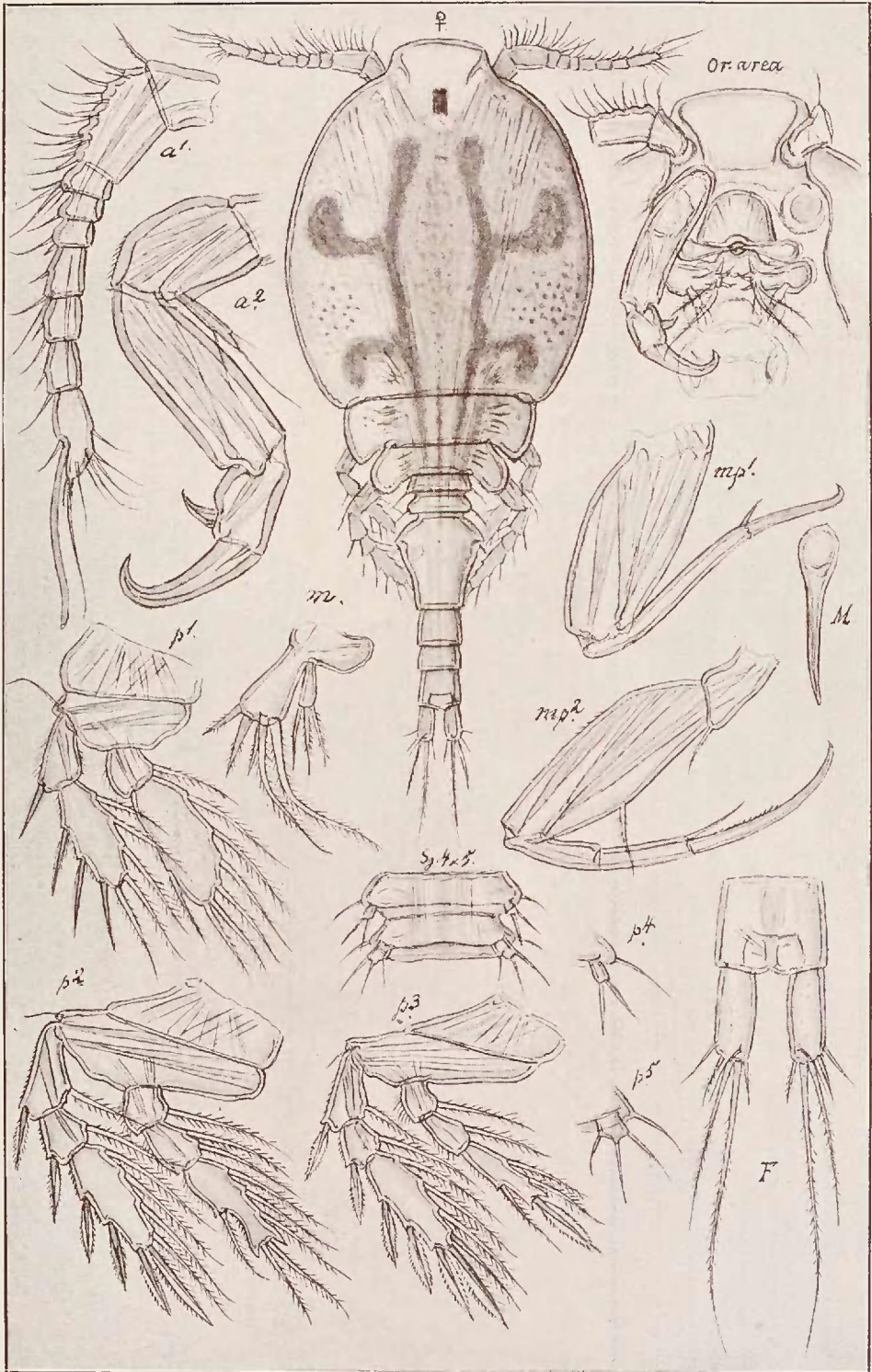


# Copepoda

Cancerillidæ.

Cyclopoida.

Pl. LXXIX.



G. O. Sars, del.

*Parartotrogus arcticus*, Scott.



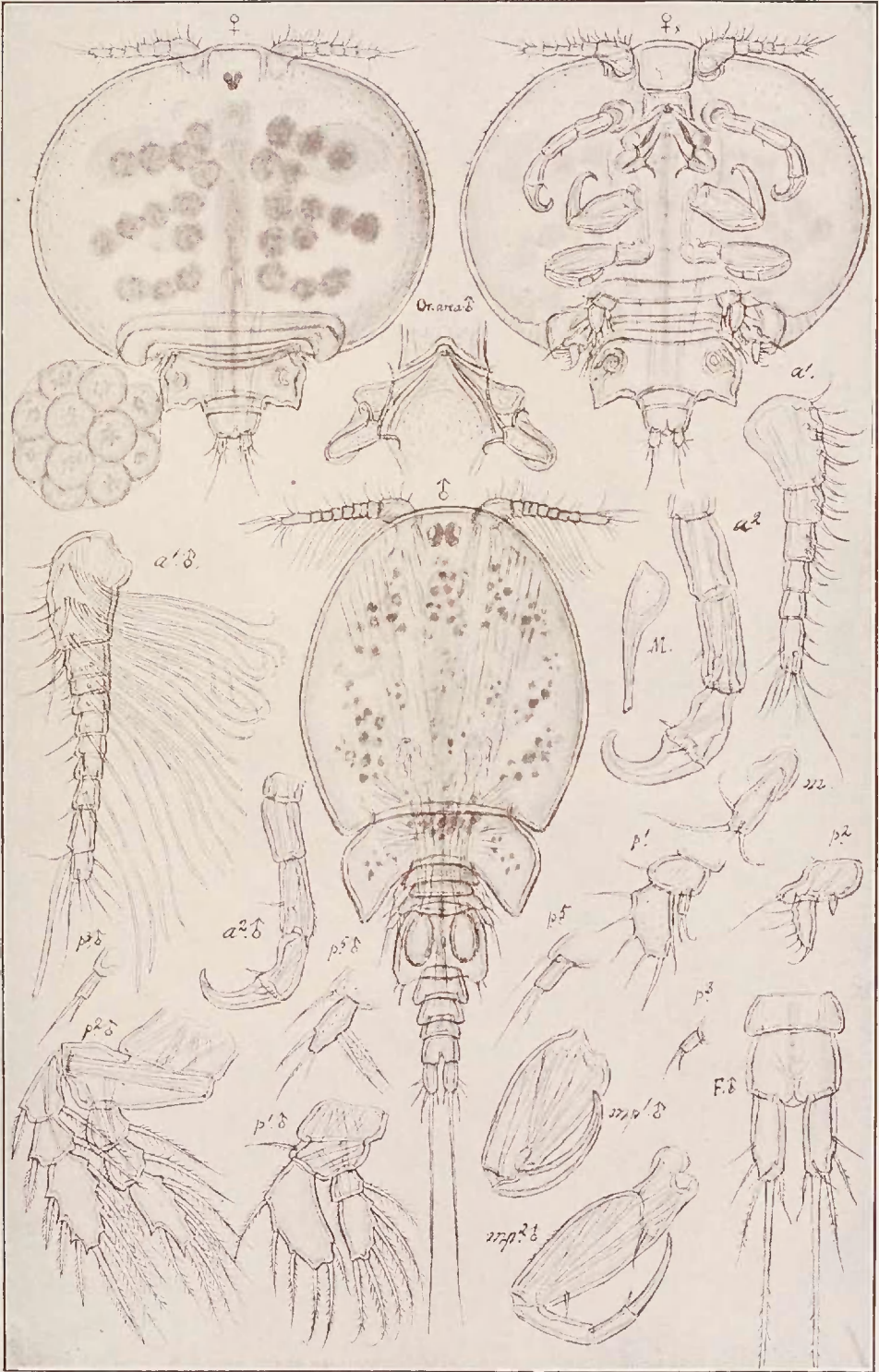


# Copepoda.

Cancerillidæ.

Cyclopoida.

Pl. LXXX.



G. O. Sars, del.

*Cancerilla tubulata*, Dalyell.

