AN ACCOUNT

OF THE

CRUSTACEA

OF

NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

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PARTS XIX & XX

CANTHOCAMPTIDÆ (concluded), LAOPHONTIDÆ (part)

WITH 16 AUTOGRAPHIC PLATES

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Occurrence.—Only some few female specimens of this form have hitherto come under my notice. They were collected from some samples taken off the south coast of Norway, at Risör and Farsund, from moderate depths.

Gen. 48. **Parameira**, G. O. Sars, n.

Generic Characters.—Body comparatively short and stout, cylindrical in form, with rather thin and pellucid integuments. Cephalic segment not very large, rostral projection obsolete. Urosome unusually thick, and scarcely at all attenuated behind, segments only spinulose at the hind edge ventrally; anal opercle smooth and more or less projecting. Caudal rami small. Eye wholly absent. Anterior antennæ comparatively short, 8-articulate, with the setæ of the anterior edge stout and curved, in some cases plumose. Posterior antennæ with the basal part imperfectly subdivided, outer ramus small, uni- or biarticulate. Mandibular palp simple, biarticulate, proximal joint scarcely expanded inside. Maxillæ and maxillipeds about as in *Ameira*. 1st pair of legs imperfectly prehensile, inner ramus somewhat longer than outer, and 3-articulate, with the 1st joint much shorter than the other 2 combined, the latter scarcely at all bent upon the 1st. Natatory legs with both rami well developed, 3-articulate, last joint of outer ramus in the 3rd and 4th pairs of legs and that of the inner ramus in the 3rd pair with 3 setæ inside. Last pair of legs with the distal joint narrow, inner expansion of proximal joint comparatively short.

Remarks.—This new genus is nearly allied to *Ameira*, yet differing in the less slender form of the body, the want of any distinct rostrum, and also in a somewhat different structure of the antennæ and legs. Two Norwegian species will be described below, and I am now of opinion that also the form described above as *Ameira simplex* Norm. should more properly be referred to this genus. Moreover the 2 species recorded by Th. Scott as *Ameira reflexa* and *A. longiremis* are undoubtedly congeneric with those here described.

142. Parameira parva (Boeck).

(Pl. CXLVI).

Ameira parva, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. f. 1872, p. 49.

Syn: *Ameira longiremis*, var. *intermedia*, Scott.

Specific Characters.—Female. Body short and stout, with the anterior division scarcely longer and but very little broader than the posterior. Cephalic segment shorter than the 3 succeeding ones combined, and somewhat narrowed in front. Last segment of urosome shorter than the preceding one, anal opercle greatly prominent, semilunar. Caudal rami very small, scarcely longer than they are broad and somewhat obliquely truncated at the tip, apical setæ not much prolonged. Anterior antennæ scarcely more than half as long as the cephalic segment, some of the setæ of the anterior edge distinctly ciliated. Posterior antennæ with the outer ramus very small and uniarticulate, carrying only 2 setæ at the tip. 1st pair of legs comparatively small, 2nd basal joint produced at the inner corner to a conical process tipped with a strong denticulated spine, inner ramus only slightly exceeding in length the outer, 1st joint rather thick, oval in form, last joint about same length, but much narrower, linear, and, like the 2 preceding joints, fringed outside with coarse spinules, each of the joints carrying inside a well-developed plumose seta. Natatory legs with the rami comparatively narrow, and in the 2 anterior pairs, only little different in length. Last pair of legs with the distal joint conical in form, being narrowly exserted at the tip, marginal setæ 5 in number and rather unequal, the 2 apical ones much smaller than the others; inner expansion of proximal joint narrow triangular in shape, and extending nearly to the middle of the distal joint, marginal setæ 4 in number, 2 of them issuing from the inner edge.

Colour whitish grey.

Length of adult female 0.63 mm.

Remarks.—This form was first briefly described by Boeck as a species of his genus *Ameira*. The form recorded by Th. Scott as *Ameira longiremis*, var. *intermedia*, seems to be identical with Boeck's species, which may be regarded as the type of the present genus.

Occurrence.—I have met with this form occasionally in several places of both the south and west coasts of Norway, as also in the Trondhjem Fjord. It is generally found in depths ranging from 20 to 50 fathoms, muddy bottom. Not the slightest trace of eye could be detected in the living animal.

Distribution.—Scottish coast (Scott).

143. Parameira major, G. O. Sars, n. sp.

(Pl. CXLVII).

Specific Characters.—Female. Very like the preceding species in its general appearance, but of larger size and somewhat more slender form of body. Cephalic segment scarcely longer than the 2 succeeding ones combined, and evenly rounded in front. Last caudal segment fully as large as the preceding one, anal opercle far less prominent than in *P. parva*. Caudal rami, on the other hand, more produced, being almost twice as long as they are broad, and transversely truncated at the tip. Anterior antennæ resembling in structure and seize those in the preceding species; none of the setæ however ciliated. Posterior antennæ with the outer ramus distinctly biarticulate and carrying 3 setæ, 2 apical and one lateral. 1st pair of legs comparatively larger than in *P. parva*, inner ramus considerably longer than the inner, with the 1st joint oblong in form. Natatory legs with the inner ramus much shorter than the outer, joints of both rami rather expanded. Last pair of legs rather unlike those in the preceding species, distal joint narrow oblong in form, scarcely at all attenuated towards the end, which is obliquely truncated, one of the apical setæ very slender and elongated; inner expansion of proximal joint short and broad, all 4 setæ issuing from the bluntly truncated end.

Colour whitish.

Length of adult female 0.82 mm.

Remarks.—This form, though nearly related to *P. parva*, is evidently specifically distinct, differing, as it does, both by its larger size and in the structure of some of the appendages, as pointed out in the above diagnosis. It also differs from the 2 species described by Th. Scott as *Ameira reflexa* and *A. longiremis*.

Occurrence.—Only some few specimens of this form have as yet come under my notice. They were found at Farsund, south coast of Norway, in a depth of about 30 fathoms, muddy sand.

Gen. 49. **Ameiropsis**, G. O. Sars, n.

Generic Characters.—Body resembling in form that in the genus *Ameira*, though being somewhat more robust, with the urosome broader and somewhat depressed in its anterior part. Rostral projection small, but distinct. Caudal

rami short. Anterior antennæ 8-articulate, with the first 2 articulations much the largest. Posterior antennæ with the basal part distinctly subdivided, outer ramus biarticulate, last joint small, but well defined. Mandibular palp distinctly biramous, with both rami uniarticulate and of equal size. Maxillæ with the exopodal and epipodal lobes well defined. Anterior maxillipeds with 2 digitiform lobes inside the claw-bearing joint. 1st pair of legs rather strongly built and distinctly prehensile, inner ramus, as usual, longer than the outer and 3-articulate, with the last 2 joints comparatively short and bent upon the 1st. Natatory legs well developed, resembling in structure those in the genus *Parameira*, inner ramus of 3rd pair of legs not transformed in male. Last pair of legs with the distal joint more or less produced, tapering towards the end; inner expansion of proximal joint of moderate size, triangular in form.

Remarks.—This new genus also bears a close relation to *Ameira*, as indicated by the name here proposed. It is however prominently distinguished by the much fuller development of the oral parts, and more particularly by the distinctly biramous mandibular palp. In the structure of the posterior antennæ and legs also some well-marked differences are found to exist. The form recorded by Brady in his Monograph as *Ameira longipes* Boeck, according to the structure of the mandibles, undoubtedly belongs to the present genus, and this is also the case with some of the new species of *Ameira* described by Th. Scott. In the following pages 3 Norwegian species will be described.

144. Ameiropsis brevicornis, G. O. Sars, n. sp.

(Pl. CXLVIII).

? Syn: *Ameira longipes*, Brady (not Boeck).

Specific Characters.—Female. Body comparatively robust, with the anterior division somewhat tumefied in front. Cephalic segment of moderate size and evenly rounded in front, rostral projection very small. Urosome much shorter than the anterior division, last segment about the size of the preceding one, anal opercle very small. Caudal rami scarcely as long as they are broad, and somewhat obliquely truncated at the tip, apical setæ of moderate length. Eye imperfectly developed. Anterior antennæ rather short and stout, scarcely exceeding half the length of the cephalic segment, proximal part about twice the length of the terminal one. Outer ramus of posterior antennæ with the proximal joint smooth inside and gradually widening somewhat towards the end, last joint transversely truncated at the end, with the 2 apical setæ somewhat unequal in length.

1st pair of legs with the outer ramus about the length of the 1st joint of the inner, last joint a little longer than the 2nd and armed with 3 claw-like spines and 2 geniculate setæ; inner ramus with the 1st joint about twice the length of the other 2 combined, seta of the inner edge somewhat remote from the apex, last joint longer than the 2nd, and armed at the tip with a very slender claw and 2 unequal setæ. Last pair of legs with the distal joint oblong conical in form and obliquely truncated at the tip, both edges densely ciliated; inner expansion of proximal joint scarcely extending to the middle of the distal joint, and armed with 4 strong spiniform setæ, the outermost but one much the longest.

Colour dark yellow.

Length of adult female 0.63 mm.

Remarks.—The present species seems to be that described by Brady in his monograph as *Ameira longipes* Boeck. It is quite certainly very different from the form so named by Boeck, of which a description has been given above. The form recorded by Brady as the male does not belong to the species described, but more properly to a species of *Amphiascus*, as clearly shown by the prominent rostrum and the transformed inner ramus of the 3rd pair of legs.

Occurrence.—I have met with this species occasionally off the south coast of Norway, at Risør, Lillesand and Farsund, in moderate depths, among algæ. In the living animal no distinctly defined eye could be detected, but only some irregularly disposed dark pigmentary patches occupying its place.

Distribution.—British Isles (Brady).

145. Ameiropsis longicornis, G. O. Sars, n. sp.

(Pl. CXLIX).

Specific Characters.—Female. Body somewhat more slender than in the preceding species, with the anterior division scarcely longer than the posterior. Cephalic segment about the length of the 3 succeeding segments combined and rather deep, rostral projection very small. Last caudal segment shorter than the preceding one. Caudal rami broader than they are long and transversely truncated at the tip. Eye in living specimen distinctly perceptible and of light red colour. Anterior antennæ much more elongated than in the preceding species, exceeding even in length the cephalic segment, proximal part considerably more than twice as long as the terminal one. Outer ramus of posterior antennæ with the proximal joint narrow fusiform in shape and edged inside with small spinules, terminal joint very small, with the 2 apical setæ of equal size. 1st pair of legs

with the outer ramus shorter than the 1st joint of the inner, its last joint about the size of the middle one; inner ramus with the 1st joint 3 times as long as the other 2 combined, and having the seta of the inner edge attached close to the apex, last joint scarcely longer than the 2nd. Last pair of legs with the distal joint almost exactly as in the preceding species, inner expansion of proximal joint, however, more produced and armed with 5 setæ, the outermost one rather small.

Colour whitish with a faint yellow tinge.

Length of adult female 0.60 mm.

Remarks.—This species is at once distinguished from the preceding one by the much greater length of the anterior antennæ. It also exhibits some minor differences in the structure of the outer ramus of the posterior antennæ and in that of the 1st and last pairs of legs.

Occurrence.—I have met with this form occasionally in the same places, in which the preceding species occurred.

146. Ameiropsis mixta, G. O. Sars, n. sp.

(Pl. CL).

Specific Characters.—Female. Body resembling in its general appearance closely that of the 2 preceding species. Rostral projection, however, somewhat more prominent. Anterior antennæ about the length of the cephalic segment, proximal part twice the length of the terminal one. Outer ramus of posterior antennæ with the proximal joint narrow linear in form and quite smooth inside, distal joint comparatively larger than in the 2 preceding species, and having one of the setæ remarkably thickened, sabre-like. 1st pair of legs with the outer ramus shorter than the 1st joint of the inner, its last joint somewhat smaller than the middle one; inner ramus with the 1st joint rather narrow, and having the seta of the inner edge far remote from the apex and attached about in the middle of the joint, last 2 joints slightly unequal in size, and combined not attaining half the length of the 1st. Last pair of legs with the distal joint very narrow, sublinear in form; inner expansion of proximal joint comparatively short, with only 4 marginal setæ.

Colour not yet ascertained.

Length of adult female 0.60 mm.

Remarks.—This species is closely related to the 2 preceding ones, and may easily be confounded with them. On a closer examination, however, it is found to differ from any of them in some of the anatomical details, occupying, as it were, and intermediate range; hence the specific name here proposed.

Occurrence.—Only very few specimens of this form have hitherto come under my notice. One of these was found at Haugesund, west coast of Norway, the others at Lillesand, belonging to the south coast of the country, the depth ranging from 20 to 50 fathoms.

Gen. 50. **Stenocopia**, G. O. Sars, n.

Generic Characters.—Body moderately slender and somewhat depressed in its anterior part, with the segments more or less sharply marked off from each other and clothed at the hind edge with small spinules or setæ. Rostral projection small. Caudal rami much produced and narrow linear in form. Eye absent. Anterior antennæ exceedingly slender and only sparingly setiferous, 8-articulate, with the 1st joint much the largest; those in male hinged in the usual manner. Posterior antennæ likewise slender, basal part distinctly subdivided, outer ramus uni- or biarticulate. Buccal area greatly prominent. Oral parts on the whole resembling in structure those in the genus *Ameiropsis*. Legs very slender and elongated. 1st pair distinctly prehensile, with the inner ramus 3-articulate and longer than the outer, last 2 joints more or less bent upon the 1st. Natatory legs with both rami narrow and elongated, number of setæ about as in the genus *Ameiropsis;* inner ramus of 3rd pair in male not transformed. Last pair of legs with the distal joint long and narrow, inner expansion of proximal joint lamellar, with a varying number of marginal setæ.

Remarks.—This new genus in some points exhibits a remote affinity to *Ameiropsis*, especially as regards the structure of the oral parts. It differs however both from this and the other genera comprised within the present family, in the general appearance of the body, the greatly produced caudal rami, and the slender and narrow form of the antennæ and of the rami of the natatory legs. It is from this last character that the name of the genus here proposed has been derived. Two very distinct Norwegian species of this genus will be described below, one of them having been previously recorded by Th. Scott as a species of the genus *Ameira*. Both species are true deep-water forms.

147. Stenocopia longicaudata (Scott).

(Pl. CLI & CLII).

Ameira longicaudata, Th. Scott, Additions to the Fauna of the Firth of Forth: 10th Ann. Rep. of the Fishery Board for Scotland, Part III, p. 250, Pl. IX, figs. 1—18.

Specific Characters.—Female. Body comparatively slender, and, viewed dorsally, of almost equal width throughout. Cephalic segment rather large and deep, with the lower edges strongly curved, rostral projection small but distinct, blunt at the tip. All the body-segments finely spinulose at the hind edge dorsally. Urosome, including the caudal rami, exceeding in length the anterior division, genital segment not dilated in front, and almost as long as the 3 succeeding segments combined; last segment considerably smaller than the preceding one, anal operele small and finely ciliated at the edge. Caudal rami exceedingly slender and narrow, equalling in length the 3 posterior caudal segments combined, apical setæ much elongated. Anterior antennæ fully twice the length of the cephalic segment and gradually attenuated distally, 1st joint about the length of the 2 succeeding joints combined, terminal part of about same length, and having the last joint much the largest. Posterior antennæ with the outer ramus rather slender and distinctly biarticulate, last joint very small and carrying one apical and one lateral seta. 1st pair of legs moderately slender, outer ramus shorter than the 1st joint of the inner, its last joint nearly as long as the middle one, and armed with 3 clawlike spines and 2 geniculate setæ; inner ramus with the 1st joint more than twice as long as the other 2 combined, seta of the inner edge remote from the apex, last joint a little longer than the preceding one, and carrying on the tip a moderately long claw and 2 unequal setæ. Natatory legs of normal appearance, inner ramus shorter than the outer, especially in the 4th pair. Last pair of legs with the distal joint narrowly exserted at the end, and only ciliated along the outer edge, marginal setæ 5 in number and sowewhat unequal; inner expansion of proximal joint rather broad and extending to about the middle of the distal joint, marginal setæ 5 in number.

Male resembling the female in its general appearance, though easily recognizable by the hinged anterior antennæ. 1st pair of legs with the spine inside the 2nd basal joint slightly transformed, being somewhat hamate at the tip. Last pair of legs with the distal joint much smaller than in female and fusiform in outline, having an additional seta inside; inner expansion of proximal joint very slight, with only 3 marginal setæ.

Colour in both sexes a dark grey.

Length of adult female 0.82 mm.

Remarks.—This form was described by Th. Scott in the above quoted paper as a species of the genus *Ameira*. It cannot, however, by no means be referred to that genus, as defined by Boeck, differing, as it does, very essentially both in its outer appearance and in the structure of the several appendages. Nor can it in my opinion be referred to any of the other genera comprised within the present family, for which reason I have felt justified to establish for its reception a new genus.

Occurrence.—I found this peculiar form many years ago in the upper part of the Christiania Fjord at a depth of about 30 fathoms, muddy bottom, and I have recently also collected it in another place, viz., at Farsund, south coast of Norway in about the same depth. In none of these places it occurred in any abundance, but only quite occasionally. No trace of any true eye could be detected in the living animal.

Distribution.—Scottish coast (Scott).

148. Stenocopia setosa, G. O. Sars, n. sp.

(Pl. CLIII & CLIV).

Specific Characters.—Female. Body somewhat less slender than in the preceding species, with the anterior division broader than the posterior, and having the segments sharply marked off from each other, with conspicuous lateral incisions between them. Integuments very thin and pellucid, being clothed both at the hind edge of the segments and laterally with slender curved hairs. Cephalic segment comparatively short and broad, exhibiting on each side behind a knob-like setiferous prominence, rostral projection very slight, almost obsolete. Urosome (including the caudal rami) about the length of the anterior division, but rather narrower, genital segment projecting at the base on each side to a rounded prominence clothed with hair-like setæ, last segment larger than the preceding one, and carrying behind, to each side of the anal fissure, a remarkably long and slender hair pointing straight behind, anal opercle finely ciliated at the edge. Caudal rami about the length of the 2 posterior segments combined, and very narrow, linear in form, apical setæ much elongated. Anterior antennæ resembling in structure those in the preceding species, though not fully as long, proximal part scarcely attaining twice the length of the terminal one. Outer ramus of posterior antennæ rather small and uniarticulate, with only 2 unequal apical setæ. Oral parts agreeing in structure perfectly with those in the preceding species. 1st pair of legs, however, of comparatively larger size, outer ramus shorter than

the 1st joint of the inner, and having the middle joint much the largest, last joint somewhat dilated, and armed with 5 geniculated spines of exactly same appearance, though gradually increasing in length distally; inner ramus very slender, with the 1st joint scarcely at all dilated and twice the length of the other 2 combined, apical claw slender and elongated. Natatory legs with the basal part bent in an elbow-like manner, rami extending at right angle to the basal part, and extremely narrow, being less unequal than in the preceding species; terminal joint of outer ramus in 4th pair with only a single seta inside. Last pair of legs with the distal joint exceedingly narrow, linear in form, and ciliated on both edges, number of marginal setæ as in *S. longicaudata;* inner expansion of proximal joint rather small and narrowly exserted at the tip, with only 3 apical setæ.

Body pellucid, of whitish colour.

Length of adult female 0.83 mm.

Remarks.—The present species is easily distinguished from the preceding one, both by the general form of the body, and by the numerous slender hairs clothing it both dorsally and laterally, the last named character having given rise to the specific name here proposed. It also differs conspicuously in the structure of some of the appendages, though on the whole agreeing in the more essential characters, so as more properly to be regarded as congeneric with that species.

Occurrence.—Only a very limited number of specimens of this remarkable form have hitherto come under my notice. They were taken partly in the upper part of the Christiania Fjord, partly at Farsund, south coast of Norway, from depths ranging from 30 to 50 fathoms, muddy bottom.

Gen. 51. **Phyllopodopsyllus,** Scott, 1906.

Generic Characters.—Body more or less slender, but comparatively strongly built, with rather hard integuments. Anterior divison somewhat compressed and having the last segment defined in front by a conspicuous constriction. Cephalic segment comparatively large and deep, projecting in front to a short and blunt immobile rostrum. Urosome well developed and attenuated behind, genital segment (in female) large and somewhat depressed, being imperfectly subdivided in the middle, 2nd segment produced at the end ventrally. Caudal rami more or less lamellarly expanded inside, and each carrying on the tip a strong seta bulbously dilated at the base. Eye well developed. Anterior antennæ rather elongated, and composed of 8 or 9 articulations, the 1st of which is much the largest,

2nd joint produced behind into a strong claw-like process. Posterior antennæ slender, with the basal part distinctly subdivided, outer ramus small, uniarticulate, with 3 setæ, 2 apical and one lateral. Mandibular palp rather large and distintly biramous, inner ramus much the longer. Maxillæ with the exopodal and epipodal lobes well defined. Anterior maxillipeds with 4 distinct digitiform lobes inside the claw-bearing joint, and having moreover 2 or 3 small setiferous terminal joints. Posterior maxillipeds rather slender, with the terminal claw distinctly biarticulate. 1st pair of legs more or less slender, and distinctly prehensile, inner ramus much longer than the outer, and only consisting of 2 joints, the distal one small and bent upon the 1st, carrying on the tip a slender claw and a single seta. Natatory legs with the rami very unequal, the inner one being much shorter than the outer and only consisting of 2 joints. Setæ of both rami much reduced in number. 4th pair of legs conspicuously differing from the 2 preceding pairs by the excessive length of the outer ramus and the rudimentary condition of the inner one. Last pair of legs (in female) very large, foliaceous, each constituting an oval concave plate without any distinct subdivision. These plates are so arranged as to form, immediately beneath the genital segment, a large bivalvular case, into which the ova are received, without being held together by any membranous envelop.

Male unknown.

Remarks.—This genus has recently been established by Th. Scott, to include a species previously referred by him to the genus *Tetragoniceps* of Brady.[1]) The most obvious character of the present genus is unquestionably the very peculiar transformation of the last pair of legs in the female, a feature not found in any other known Copepod. It is indeed from this character that the somewhat inconvenient polysyllabic generic name proposed by Th. Scott has been derived. Two Norwegian species of this genus will be described below.

149. Phyllopodopsyllus Bradyi, Scott.

(Pl. CLV).

Tetragoniceps Bradyi, Th. Scott, Additions to the Fauna of the Firth of Forth. 10th Ann. Rep. of the Fishery Board for Scotland. Part III, p. 253, Pl. IX, figs. 19—32.

Specific Characters.— Female. Body moderately slender and conspicuously constricted in the middle. Cephalic segment fully as long as the 4 succeeding

[1]) Some other species, likewise at first referred to that genus, have by the same author been removed as types of distinct genera *(Pteropsyllus, Evansia, Leptastacus).*

segments combined, rostral projection forming a small lamella transversely truncated at the tip. Urosome nearly as long as the anterior division, genital segment attaining the length of the 3 succeeding segments combined, 2nd segment forming behind, on the ventral face, a projecting fold; last segment smaller than the preceding one, and having the anal opercle perfectly smooth. Caudal rami about the length of the anal segment, and forming inside near the base a very conspicuous rounded lamellar expansion, tip obliquely truncated, and firmly connected with the bulbously dilated base of the apical seta. Anterior antennæ about the length of the cephalic segment, and composed of 9 well defined articulations, 5 of which belong to the terminal part; 1st joint very large, occupying rather more than $^1/_3$ of the length of the whole antenna, 2nd joint produced behind to a strong conical projection, terminal part about the length of the 3 preceding joints combined, its last joint much the largest. 1st pair of legs rather slender, spine inside the 2nd basal joint far remote from the apex, outer ramus much shorter than the 1st joint of the inner, and without any seta inside, last joint smaller than the other 2, and armed with 2 spines and 2 geniculated setæ; distal joint of inner ramus scarcely attaining $^1/_4$ of the length of the proximal one. The 2 anterior pairs of natatory legs of essentially the same structure, outer ramus of moderate size and having no seta inside the middle joint and only 2 spines outside the terminal one; inner ramus scarcely more than half the length of the outer, with both joints narrow and subequal in length, the distal one armed at the tip with a spine and 2 unequal setæ, inner edge smooth. 4th pair of legs with the outer ramus almost twice as long as that of the 2 preceding pairs and very slender, each of the joints carrying inside a single seta; inner ramus scarcely longer than the 1st joint of the outer, and having the proximal joint very small. Last pair of legs exceeding in length $^1/_3$ of the whole animal, each plate produced at the postero-superior corner to a short tooth-like projection, inside which 2 unequal hair-like setæ are attached, outer edge straight and carrying 4 small setæ, inner edge slightly arcuate and inflexed, with 2 small setæ, the one in front of the middle, the other near the end, the latter finely ciliated.

Colour yellowish, with irregular brownish shadows.

Length of adult female 0.80 mm.

Remarks.—As above mentioned, this form was at first described by Th. Scott as a species of the genus *Tetragoniceps* of Brady, to which genus it certainly bears some affinity. Its separation from that genus may, however, be regarded as fully justified, and this view is still more corroborated by the detection of another species, to be described below, which agrees with the type in all essential characters, though being evidently specifically distinct.

Occurrence.—Only 3 specimens of this interesting form have hitherto come under my notice. One of these specimens was taken at Flekkerö, the other 2 at Farsund, both localities belonging to the south coast of Norway.

Distribution.—Scottish coast (Scott).

150. Phyllopodopsyllus furciger, G. O. Sars, n. sp.

(Pl. CLVI).

Specific Characters.—Female. General form of body very similar to that in the preceding species. Cephalic segment, however, still somewhat larger, exceeding in length the 4 succeeding segments combined. Urosome with the 2nd segment produced ventrally at the hind edge, as in the type species; last segment rather small, with the anal opercle more prominent and finely ciliated at the edge. Caudal rami much larger than in *P. Bradyi*, being twice as long as the anal segment, and having the inner edge evenly convex, dorsal face distinctly keeled; apical seta forming at the base a very strong dilatation projecting inside to a rounded lobule. Anterior antennæ scarcely as long as the cephalic segment, and only composed of 8 articulations, the penultimate and antepenultimate ones being fused together, 1st joint considerably exceeding in length $^1/_3$ of the whole antenna, 2nd joint produced behind to a very strong claw-like process, broader and more curved than in the type species. Posterior antennæ and oral parts of a similar structure to that in *P. Bradyi*. 1st pair of legs comparatively smaller with the joints of the outer ramus of nearly equal size, distal joint of inner ramus exceeding $^1/_3$ of the length of the proximal one, apical claw and seta extremely slender. Natatory legs almost exactly as in the type species. Last pair of legs also very similar, each plate however exhibiting in front of the middle a faint suture crossing the plate, and indicating the line of union between the two original joints, inner edge of the plate carrying, immediately in front of the suture, a series of 3 slender hair-like setæ.

Colour not yet ascertained.

Length of adult female 0.73 mm.

Remarks.—The above-described form is closely allied to *P. Bradyi*, though evidently specifically distinct, being at once distinguished by the much greater size and different form of the caudal rami. On a closer comparison moreover some other minor differences are found to exist.

Occurrence.—The solitary specimen of this form observed was found in a sample taken at Farsund, south coast of Norway, from a depth of about 30 fathoms, muddy sand.

Fam. 13. Laophontidæ.

Characters.—Body somewhat varying in shape, but having always the segments very sharply marked off from each other, with conspicuous constrictions between them, their hind edge more or less raised and generally fringed with small spinules. Genital segment in female distinctly subdivided. Anterior antennæ with the number of articulations more or less reduced, those in male strongly hinged, with the last joint of the proximal part greatly swollen. Posterior antennæ with the outer ramus generally small and uniarticulate, in some cases obsolete. Oral parts on the whole normal. 1st pair of legs with the rami very unequal, the outer one of insignificant size, the inner one powerfully developed and distinctly prehensile, biarticulate, clawed at the tip. Natatory legs generally poorly developed, with the inner ramus much smaller than the outer and only consisting of 2 joints; inner ramus of 3rd pair in male transformed. Last pair of legs of varying structure in the different genera. Ovisac in the great majority of cases single.

Remarks.—This family has recently been established by Th. Scott, to comprise the well-known genus *Laophonte* and some nearly related genera. As to the outer appearance, the forms belonging to this family may be easily recognized by the very sharp demarcation of the segments, whereby the body assumes a more or less scalariform appearance. Of the anatomical details the most obvious character is found in the structure of the 1st pair of legs, the inner ramus of which in most cases is very powerfully developed, though only consisting of 2 joints, whereas the outer ramus is of quite insignificant size. All the forms belonging to the present family are strictly marine, though some of the species of *Laophonte* may be occasionally found in more or less brackish water.

Gen. 52. Laophonte, Philippi, 1840.

Syn: *Cleta*, Claus.

Generic Characters.—Body more or less slender, scalariform, with no sharp demarcation between the anterior and posterior divisions. Cephalic segment of moderate size, and projecting in front in a lamellar rostral prominence not distinctly defined behind. Segments of urosome, except the last, more or less lamellarly expanded laterally. Caudal rami of varying shape in the different species.

Eye in most cases present Anterior antennæ, as a rule, not much elongated, their articulations never exceeding 7 in number. Posterior antennæ with the basal part not subdivided, 2 of the apical setæ converted to claw-like spines, outer ramus very small. Mandibular palp simple and generally of insignificant size. Maxillæ with the exopodal and epipodal lobes very small or obsolete. Anterior maxillipeds with 2 digitiform lobes inside the claw-bearing joint. Posterior maxillipeds rather fully developed, terminating in a strongly clawed hand. 1st pair of legs with the outer ramus feably developed, bi- or 3-articulate, and apparently quite immobile, inner ramus very powerful, with no seta inside the proximal joint, distal joint short and tipped with a single strong claw. Natatory legs with the outer ramus comparatively narrow, though in some cases much coarser in male than in female; inner ramus with the distal joint the larger, that of 3rd pair in male distinctly 3-articulate with the middle joint produced at the end. Last pair of legs with both joints well defined, the proximal one being more or less lamellarly expanded inside; those in male much smaller than in female. A single ovisac present in the female.

Remarks.—This genus was established by Philippi as early as the year 1840, to include a species found by him at Naples. The genus *Cleta* of Claus is undoubtedly identical with Philippi's genus. The species belonging to this genus are easily recognizable by the slender scalariform body, and the greatly produced and clawed inner ramus of the 1st pair of legs. The genus seems to be very rich in species, and is represented in all parts of the Oceans. In the following pages will be described a rather great number of species belonging to the Norwegian fauna.

151. Laophonte cornuta, Philippi.

(Pl. CLVII & CLVIII).

Laophonte cornuta, Philippi, Zoologische Bemerkungen. Archiv für Naturgeschichte 1840, p. 189, Pl. III, fig. 13.

Syn: *Cleta forcipata*, Claus.
„ *Laophonte serrata*, Brady (not Claus).
„ *? Harpacticus fortificationis*, Fischer.

Specific Characters.—Female. Body rather slender, sub-cylindric in shape, with well-marked constrictions between the segments, which are somewhat raised dorsally. All segments fringed at the hind edge with knob-like spinules having between them a fine hair. Integuments very hard, and exhibiting under the microscope a peculiar pitted appearance. Cephalic segment about the length of

the 4 succeeding segments combined and rather deep, with a transversal depression about in the middle dorsally; rostral projection rather broad and terminating in an obtuse point. Urosome about as long as the anterior division, genital segment, like the succeeding one, slightly expanded laterally; last segment quadrangular in shape, anal opercle tipped with a somewhat erect spine. Caudal rami about as long as the anal segment and slightly attenuated distally, without any spinules, but with a slender seta about in the middle of the outer edge and another close to the tip, the latter carrying a single very strong spiniform seta not jointed at the base. Anterior antennæ not nearly attaining the length of the cephalic segment and of a very coarse structure, consisting of only 4 articulations, the last 2 joints of the proximal part and all of the terminal part being fused together into single joints. 1st and 2nd joints each produced behind to a claw-like projection, that of the 2nd joint being much the larger. Posterior antennæ likewise rather strongly built, with the 2 apical spines claw-like, outer ramus very small and somewhat lamellar, carrying 4 comparatively short setæ. Mandibular palp of insignificant size and rather narrow, with 4 somewhat unequal setæ at the end. Posterior maxillipeds of moderate size. 1st pair of legs with the outer ramus only consisting of 2 joints, and scarcely more than half as long as the 1st joint of the inner; the latter exceedingly powerful, with the apical claw strong and slightly curved at the tip. Natatory legs exhibiting the structure characteristic of the genus, proximal joint of inner ramus with a well-developed seta inside. Last pair of legs comparatively large, foliaceous, distal joint oblong oval in form, and carrying 6 marginal setæ along the outer edge and the tip, 2 of them being very thin and hair-like; inner expansion of proximal joint narrow linguiform and extending to about the middle of the distal joint, its surface exhibiting a peculiar areolated structure, marginal setæ 5 in number, one of them being far remote from the others and attached in front of the middle of the inner edge. Ovisac comparatively small and of rounded form.

Male resembling the female in its general appearance, but easily recognizable by the strongly hinged anterior antennæ, the 4th joint of which is greatly dilated and produced in front near the base to a hamiform process. Inner ramus of 3rd pair of legs with a straight posteriorly pointing mucroniform process issuing from the middle joint outside and extending far beyond the last joint. Last pair of legs much smaller than in female, distal joint with only 4 spiniform setæ; inner expansion of proximal joint very slight, with 2 subequal setæ.

Colour in both sexes a dark brownish gray, with still darker, almost black shadows more conspicuous on the genital segment.

Length of adult female about 1 mm.

Remarks.—The above-described form seems to be that originally recorded by Philippi as the type of his genus *Laophonte*. It has erroneously been identified by Brady and other British authors with *Cleta serrata* of Claus, which is a different species, to be described below. On the other hand, is the form described by Claus from a male specimen as *Cleta forcipata* undoubtedly identical with the present species. I am also of opinion that the form recorded by Seb. Fischer as *Harpacticus fortificationis* is referable to the same species. It is one of the largest species, and is moreover easily recognizable both by its general appearance and by the structure of the anterior antennæ and that of the 1st and last pairs of legs.

Occurrence.—This pretty species is not unfrequently found along the whole south and west coast of Norway, at least up to the Trondhjem Fjord in moderate depths among algæ, and is at once distinguished from most other species by its comparatively large size and the very dark colour of the body.

Distribution.—Mediterranean (Philippi), Madeira (Fischer), British Isles (Brady).

152. Laophonte serrata (Claus).

(Pl. CLIX).

Cleta serrata, Claus, Die freilebenden Copepoden, p. 124, Pl. XV, figs. 13—20.

Syn: *Laophonte propinqva*, Scott.

Specific Characters.—Female. General form of body rather like that in the preceding species, though perhaps somewhat less slender. All segments very sharply marked off from each other by deep constrictions, whereby the dorsal line acquires a pronouncedly jagged or serrate appearance; posterior edge of the segments fringed with densely crowded short spinules acute at the tip. Cephalic segment comparatively larger than in the type species, rostral projection rather prominent and terminating in 2 juxtaposed knob-like points. Urosome shorter than the anterior division of the body, all its segments, except the last, lamellarly expanded laterally; last segment about the length of the preceding one, anal opercle fringed with uniform spinules. Caudal rami scarcely as long as the anal segment and not tapering distally, being, in addition to the setæ, clothed both outside and inside with scattered spinules, tip transversely truncated and carrying 2 well-developed setæ jointed near the base, the inner one much the longer, setæ of the outer edge approximate and attached considerably behind the middle. Anterior antennæ scarcely exceeding half the length of the cephalic segment, but

composed of 7 well-defined articulations, the 2nd of which is produced behind to a strong conical projection. Posterior antennæ and oral parts nearly as in *L. cornuta*. 1st pair of legs comparatively more slender, with the outer ramus distinctly 3-articulate and exceeding half the length of the 1st joint of the inner, apical claw of the latter ramus rather elongated, being fully 3 times as long as the distal joint. Natatory legs resembling in structure those in *L. cornuta*, yet differing in the absence of any seta inside the proximal joint of the inner ramus. Last pair of legs much smaller than in the type species, distal joint narrow fusiform in outline, inner expansion of proximal joint triangular in form and scarcely extending to the middle of the distal joint, number of marginal setæ in both joints as in *L. cornuta*.

Male exhibiting the usual sexual differences from the female. Inner ramus of 3rd pair of legs with the projection of the middle joint peculiarly transformed, being converted to a sigmoid lamella with 2 knob-like prominences of the outer edge and partly covering the last setiferous joint. Last pair of legs with the distal joint narrow linear in form and carrying 5 setæ, one of which, attached to the inner edge, is rather strong, spiniform; inner expansion of proximal joint almost obsolete, with 2 unequal setæ.

Colour yellowish, tinged with light red or orange.

Length of adult female 0.76 mm.

Remarks.—This is unquestionably the species originally described by Claus under the name of *Cleta serrata*, as clearly shown by the figures he gives of the 1st and last pairs of legs. The form recorded by Th. Scott as *Laophonte propinqua* is identical with Claus's species. It is well distinguished from *L. cornuta* by the distinctly 7-articulate anterior antennæ, the 3-articulate outer ramus of the 1st pair of legs and the rather different shape of the last pair of legs. Moreover the anal opercle wants the erect spine found in *L. cornuta*, and the caudal rami carry each at the tip 2 normally developed setæ instead of a single such.

Occurrence.—I have met with this species not unfrequently in many places both of the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths, among algæ. Male specimens appear to be equally frequent as female ones.

Distribution.—Heligoland (Claus), Scottish coast (Scott), coast of France (Canu).

153. Laophonte depressa, Scott.

(Pl. CLX).

Laophonte depressa, Th. Scott, Additions to the Fauna of the Firth of Forth. 12th Ann. Rep. of the Fishery Board for Scotland; Part III, p. 245, Pl. VI, figs. 24—31, Pl. VII, figs. 1—3.

Specific Characters.—Female. Body comparatively shorter and stouter than in the 2 preceding species and pronouncedly depressed, with all the segments, also the cephalic one, finely ciliated laterally and minutely spinulose along the hind edge. Cephalic segment rather large and broad, impressed dorsally, and projecting in front to a lamellar rostrum of moderate size, terminating in an obtuse point. Urosome considerably shorter than the anterior division of the body, and having all the segments, except the last, lamellarly expanded laterally; anal opercle finely ciliated. Caudal rami very short, quadrangular, being scarcely longer than they are broad, and clothed, in addition to the setæ, with small spinules, some of which assume an hair-like appearance; apical setæ of moderate length and normal structure. Anterior antennæ exceeding somewhat half the length of the cephalic segment, and distinctly 7-articulate, 2nd joint simple, without any projection behind. Posterior antennæ rather robust, resembling in structure those in the 2 preceding species. Posterior maxillipeds very powerfully developed, with the terminal claw unusually strong and curved at the tip. 1st pair of legs likewise of very considerable size, with the inner ramus exceedingly strong and terminating in a falciform claw, outer ramus distinctly 3-articulate, and about half the length of the proximal joint of the inner, middle joint much the longest. Natatory legs resembling in structure those in the 2 preceding species, though having the setæ of both rami somewhat reduced in number. Last pair of legs with the distal joint rather large and subfusiform in outline, with 6 marginal setæ; inner expansion of proximal joint, on the other hand, very small and narrow, with only 3 marginal setæ at the tip.

Male with the inner ramus of the 3rd pair of legs transformed in a similar manner to that in the male of *L. serrata*, process of the middle joint, however, much narrower, not lamellar. Last pair of legs with the distal joint shorter and broader than in the male of *L. serrata*.

Colour not yet ascertained.

Length of adult female 0.70 mm.

Remarks.—The present species, recently described by Th. Scott under the above name, is easily distinguished from any of the 2 preceding species by the pronouncedly depressed form of the body, the short caudal rami, and the want of a spiniform process on the 2nd joint of the anterior antennæ. Moreover the unusually strong development of the posterior maxillipeds and of the 1st pair of

legs is rather characteristic, as also the shape of the last pair of legs in the female.

Occurrence.—A solitary femal specimen of this form was taken, some years ago, at Bukken, west coast of Norway, from moderate depth. Moreover some few male and female specimens of the same form occurred in a sample kindly sent to me from Mr. Nordgaard, who took it in the Skjærstad Fjord, immediately North of the Polar circle.

Distribution.—Scottish coast (Scott).

154. Laophonte thoracica, Boeck.

(Pl. CLXI).

Laophonte thoracica, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forhandl. f. 1864, p. 278.

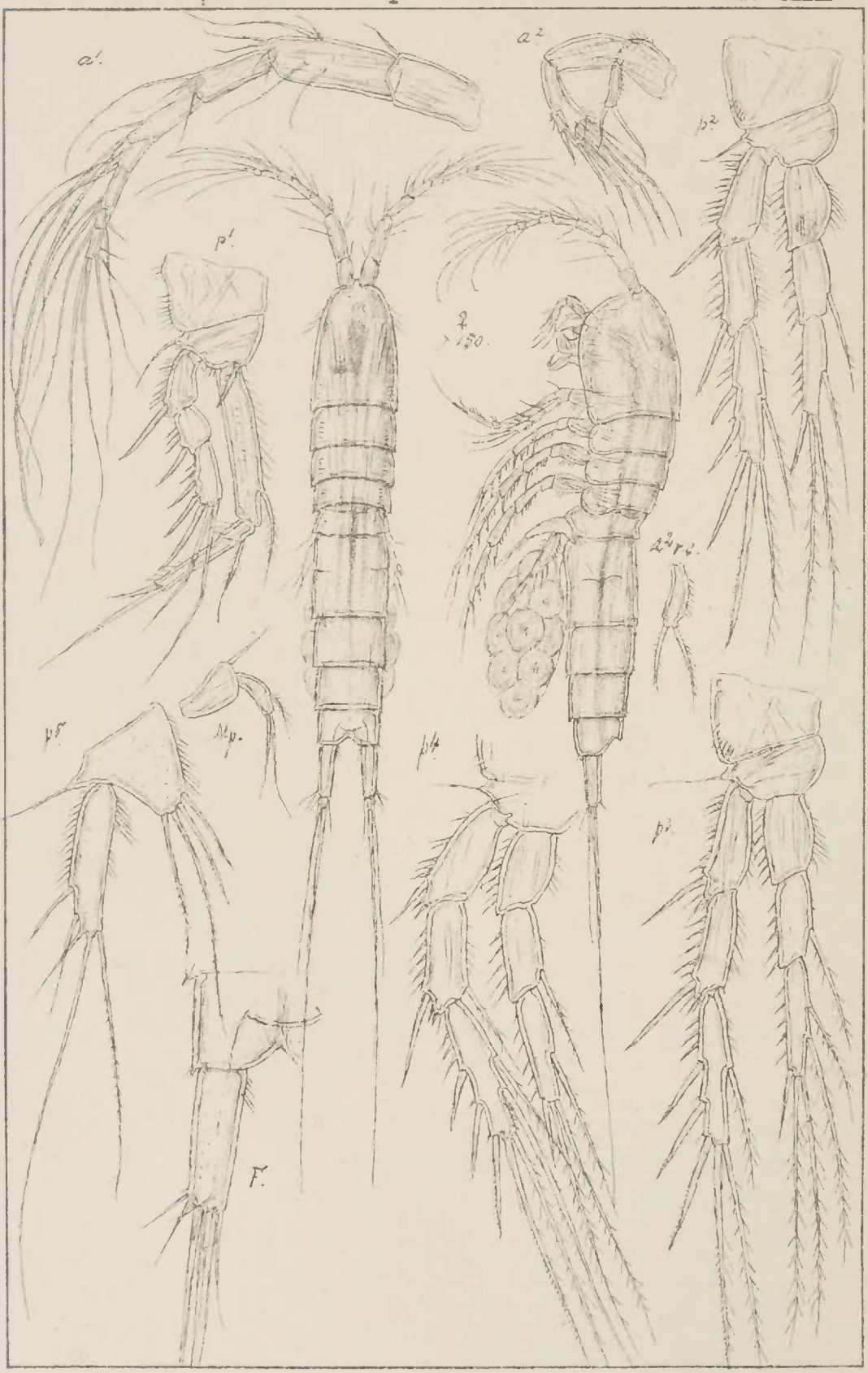
Syn: *Tetragoniceps longiremis*, Brady & Robertson.

Specific Characters.—Female. Body moderately slender and gradually tapering behind, with all the segments sharply marked off form each other and fringed at the hind edge with small spinules, laterally with delicate cilia. Cephalic segment comparatively large and deep, with the lateral parts abruptly curved in the middle, dorsal face smooth, without any perceptible depression, rostral projection comparatively small and rounded at the tip. Urosome nearly as long as the anterior division, and having the anterior segments slightly expanded laterally; last segment shorter than the preceding one, and having the anal opercle smooth. Caudal rami rather much produced, being almost twice as long as the anal segment and slightly divergent, apical setæ normal. Anterior antennæ scarcely as long as the cephalic segment and rather narrow, 6-articulate, the last 2 joints being confluent, 2nd joint the largest and without any process behind. Posterior antennæ less robust than in the 3 preceding species, outer ramus small. Posterior maxillipeds slender and elongated, with the hand only slightly dilated. 1st pair of legs far less robust than in the 3 preceding species, basal part rather narrow, outer ramus scarcely attaining half the length of the 1st joint of the inner, and distinctly 3-articulate. Natatory legs with the rami comparatively narrow, last joint of the outer one in all the pairs with only a single seta inside, proximal joint of inner ramus without any seta. Last pair of legs with the distal joint narrow fusiform in outline, marginal setæ 5 in number, that issuing from the narrowly exserted tip very delicate, hair-like; inner expansion of proximal joint quite short, carrying 4 marginal setæ, one at the tip and 3 along the inner edge. Ovisac rounded.

Copepoda

Canthocamptidæ Harpacticoida

PL. CXLV.



G. O. Sars. autogr

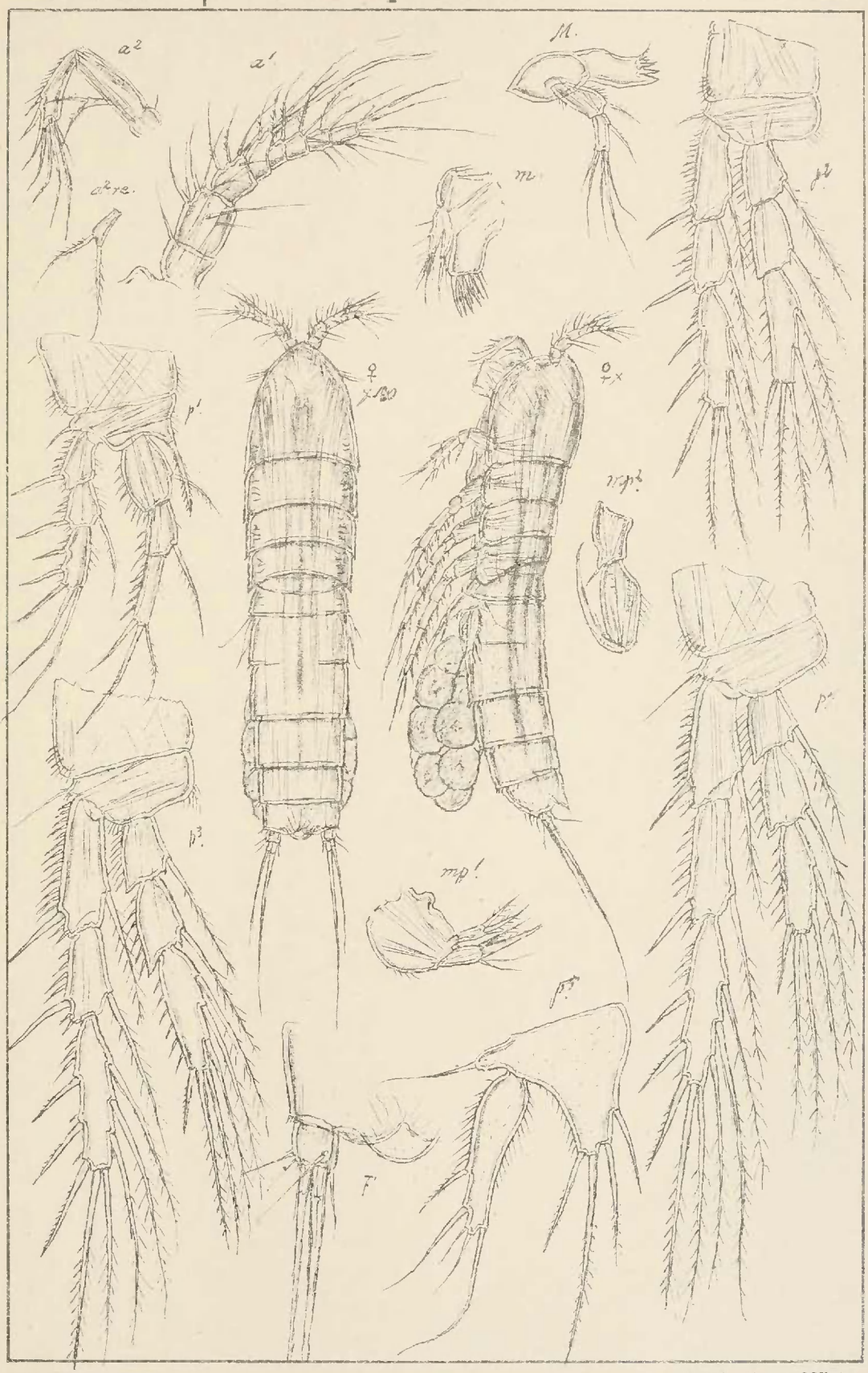
Norsk Litogr Officin.

Ameira tenella, G. O. Sars

Copepoda

Canthocamptidæ Harpacticoida

PL. CXLVI



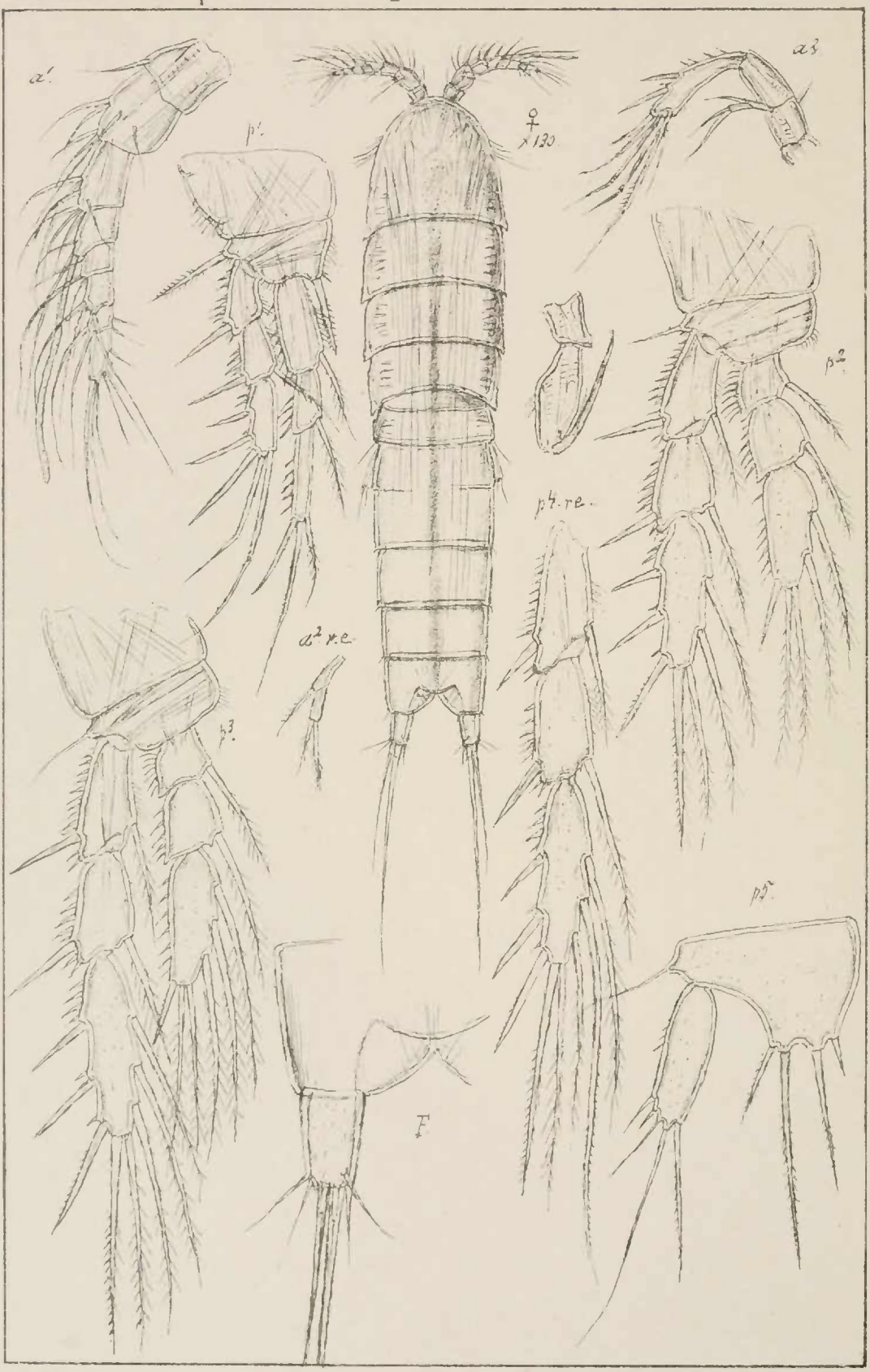
G.O. Sars, autogr.

Norsk Litogr. Officin.

Parameira parva (Boeck.)

Copepoda

Canthocamptidæ Harpacticoida PL. CXLVII



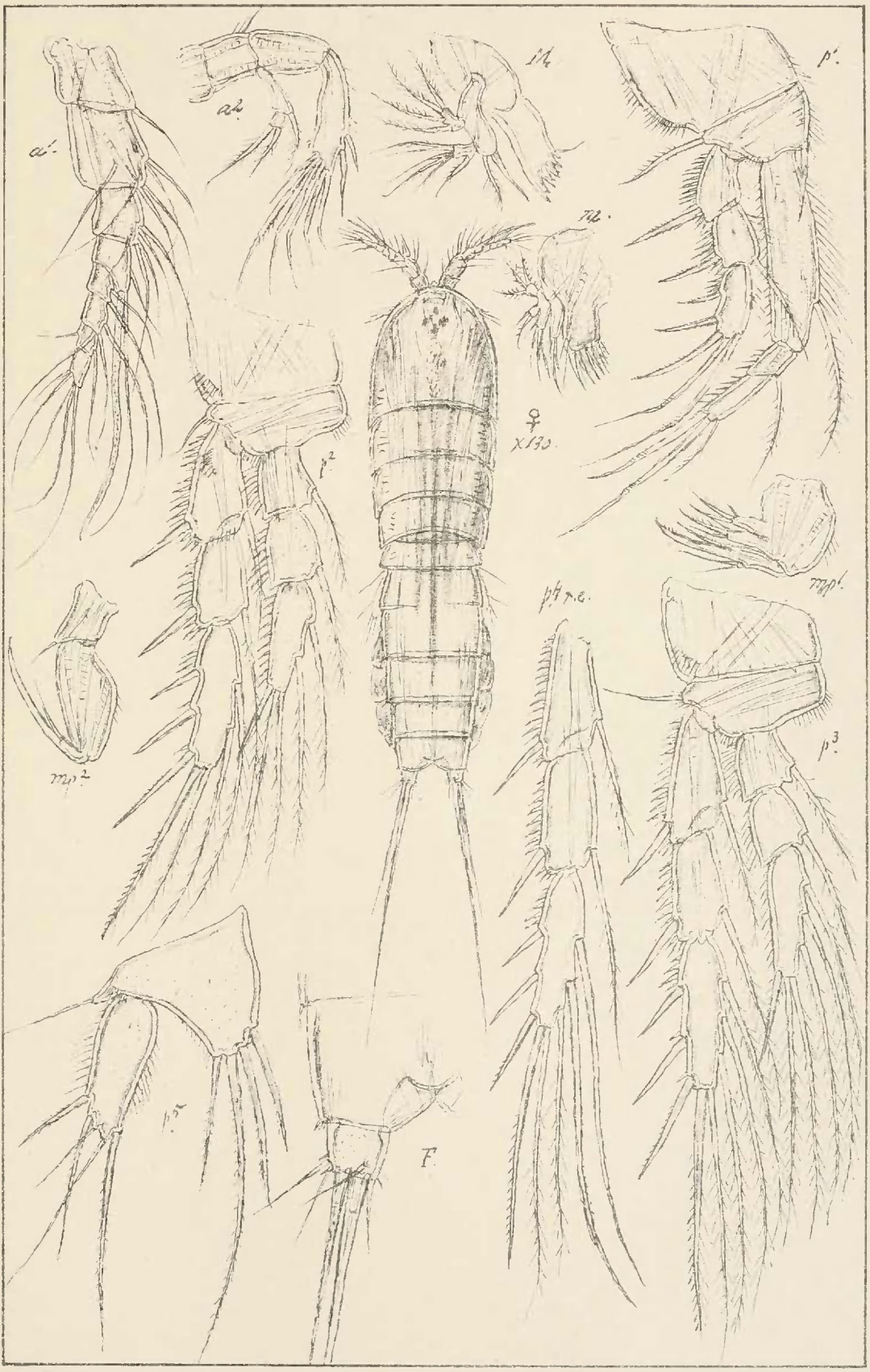
G. O. Sars, autogr. Norsk Litogr. Officin.

Parameira major, G.O.Sars

Copepoda

Canthocamptidæ Harpacticoida

PL. CXLVIII



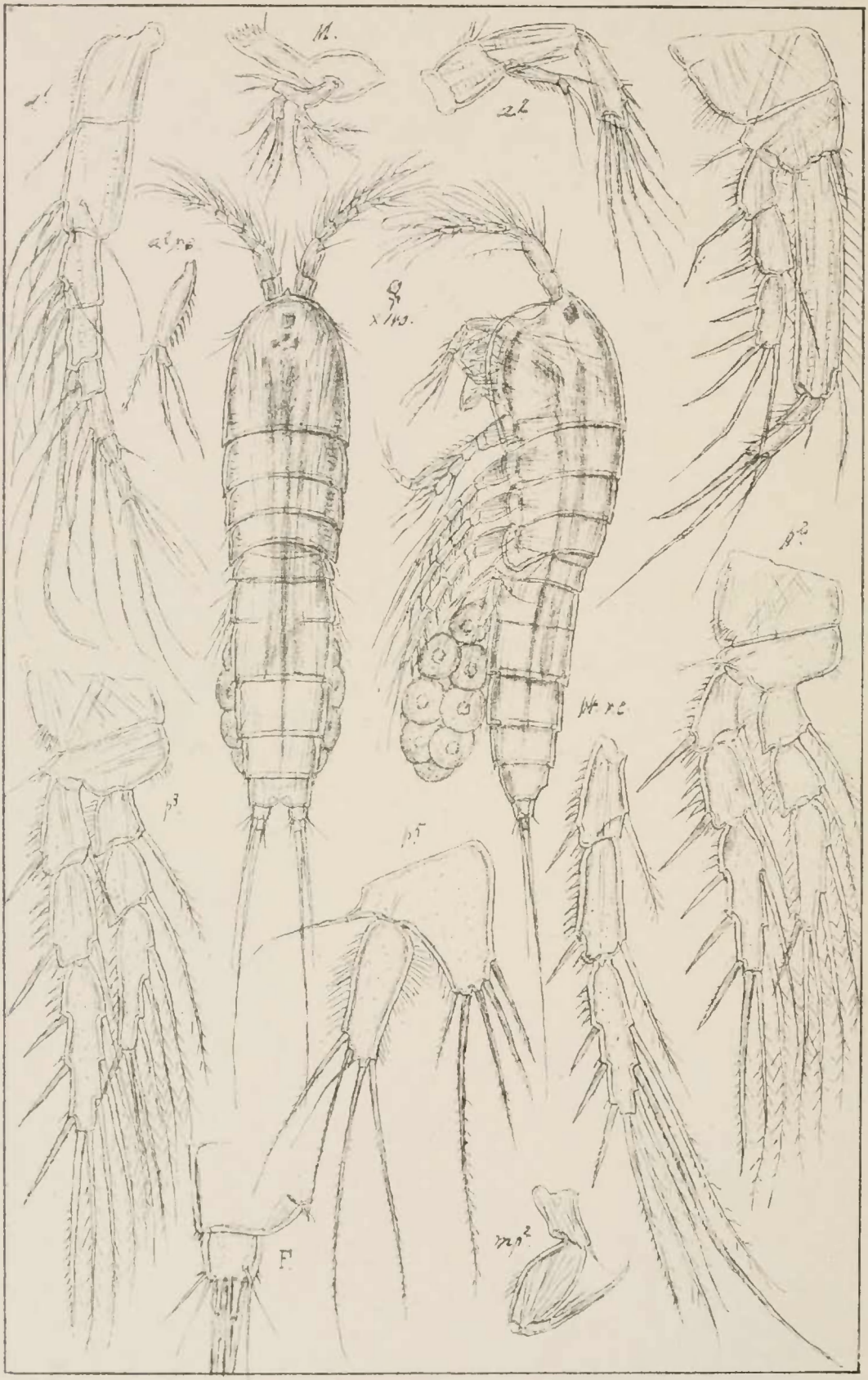
G.O. Sars, autogr.

Norsk Litogr. Officin.

Ameiropsis brevicornis, G.O.Sars

Copepoda

Canthocamptidæ Harpacticoida PL. CXLIX



G. O. Sars. autogr

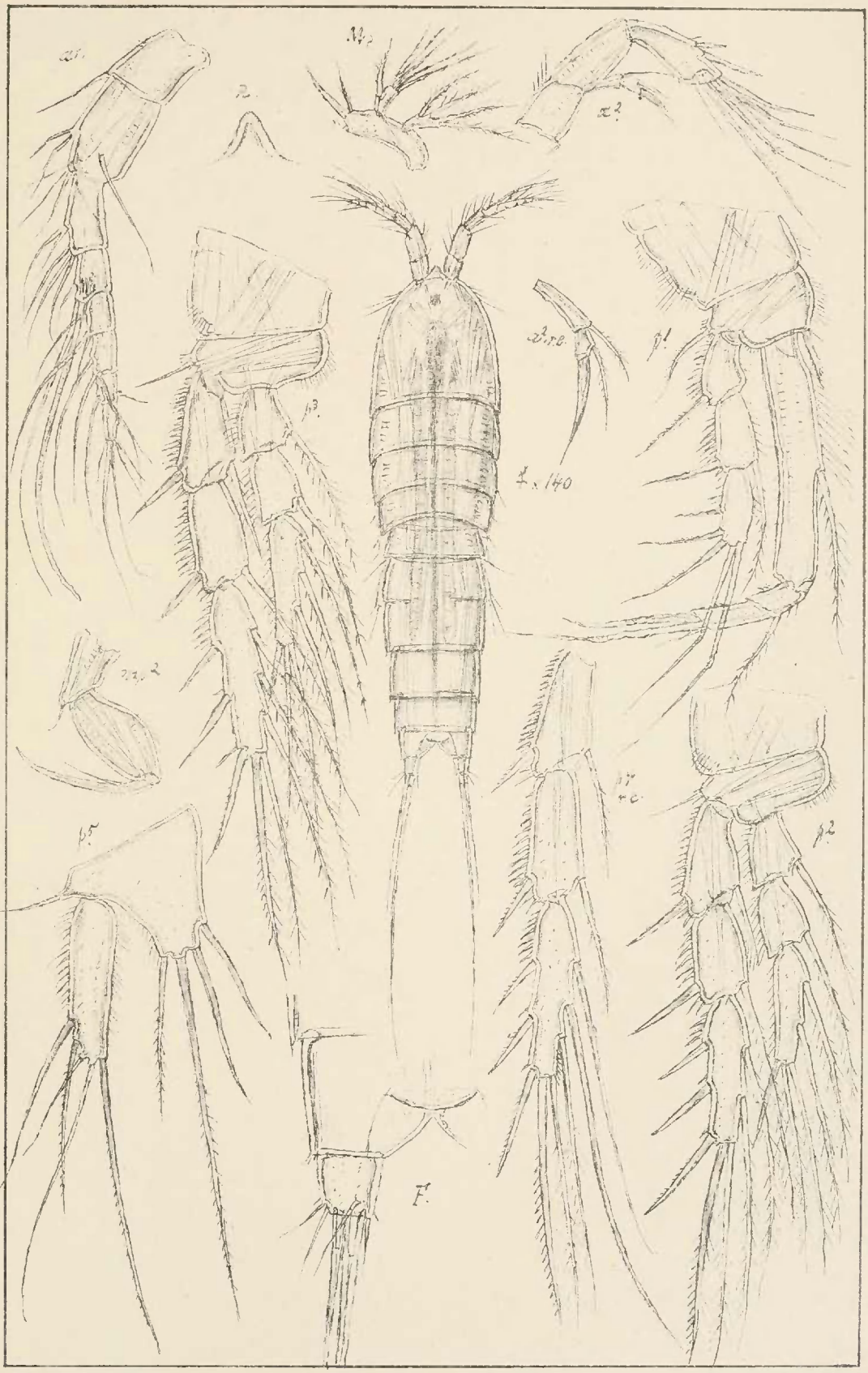
Norsk Litogr. Officin.

Ameiropsis longicornis, G. O. Sars

Copepoda

Canthocamptidæ Harpacticoida

PL. CL



G. O. Sars, autogr.

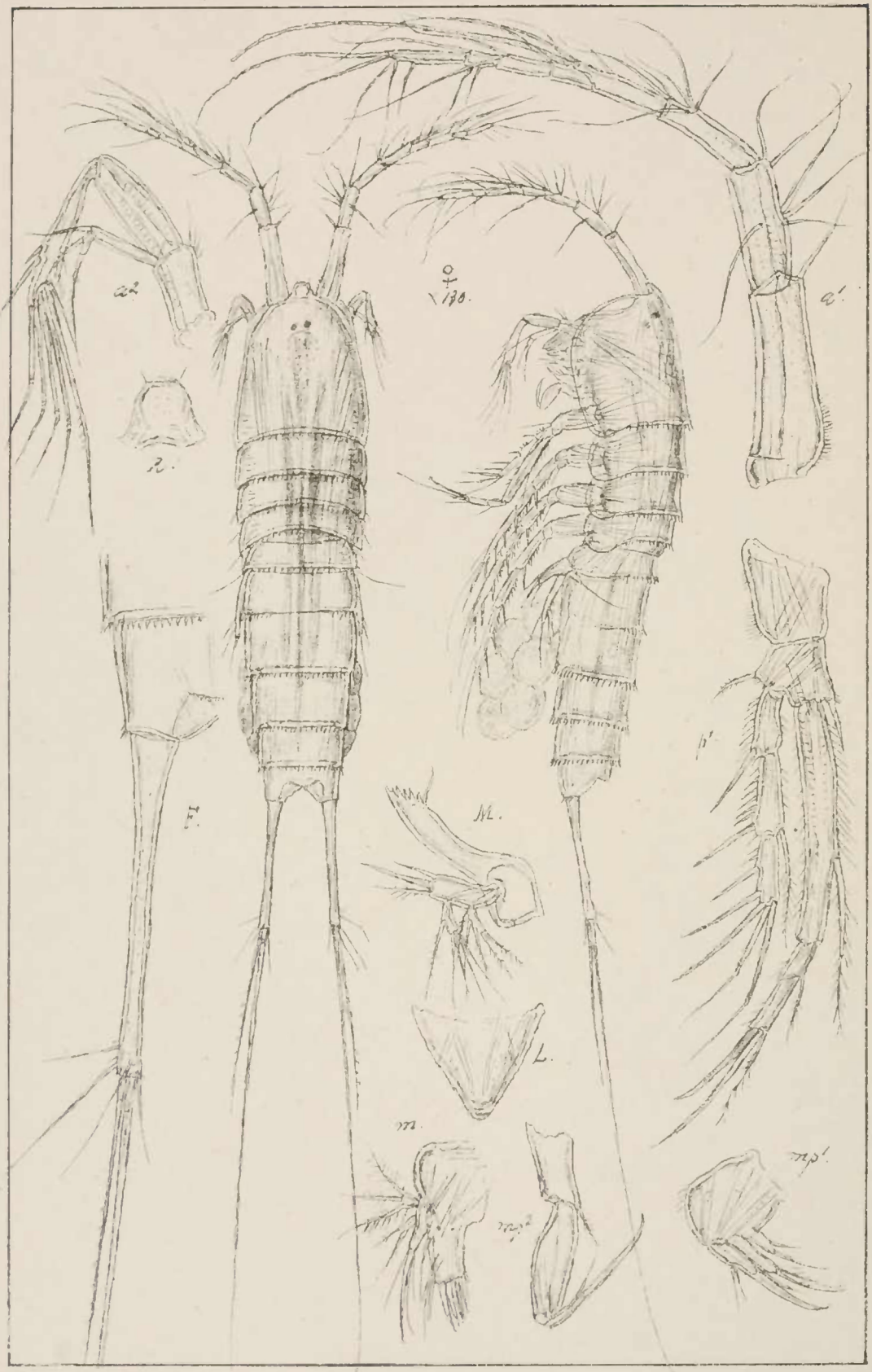
Norsk Litogr. Officin.

Ameiropsis mixta, G.O.Sars.

Copepoda

Canthocamptidæ Harpacticoida

PL.CLI



G.O. Sars, autogr.

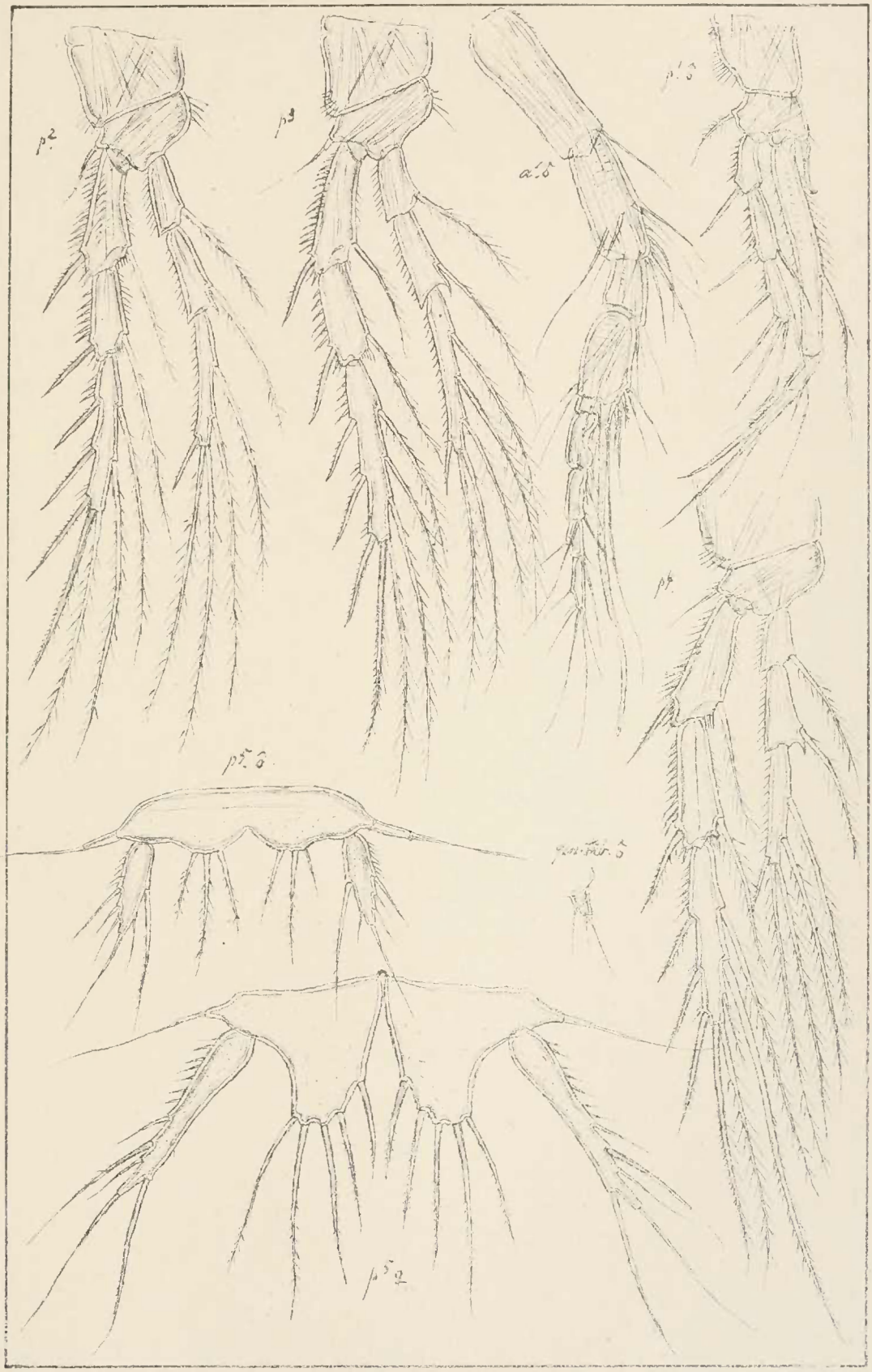
Norsk Litogr. Officin.

Stenocopia longicaudata (Scott.)

Copepoda

Canthocamptidæ Harpacticoida

PL.CLII

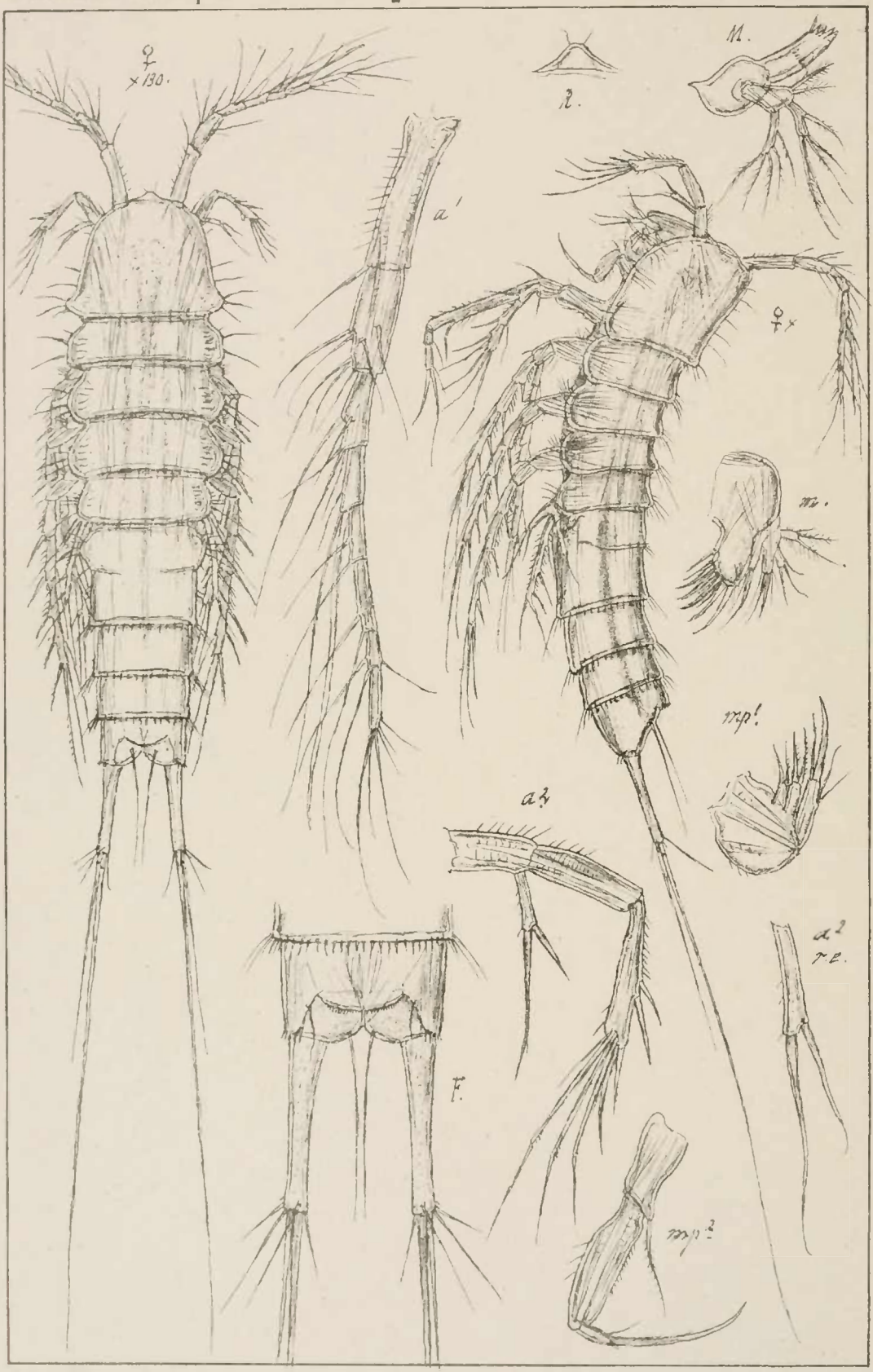


G.O Sars, autogr. Norsk Litogr. Officin.

Stenocopia longicaudata (Scott)

(continued)

Copepoda



G. O. Sars. autogr. Norsk Litogr. Officin.

Stenocopia setosa G.O.Sars.

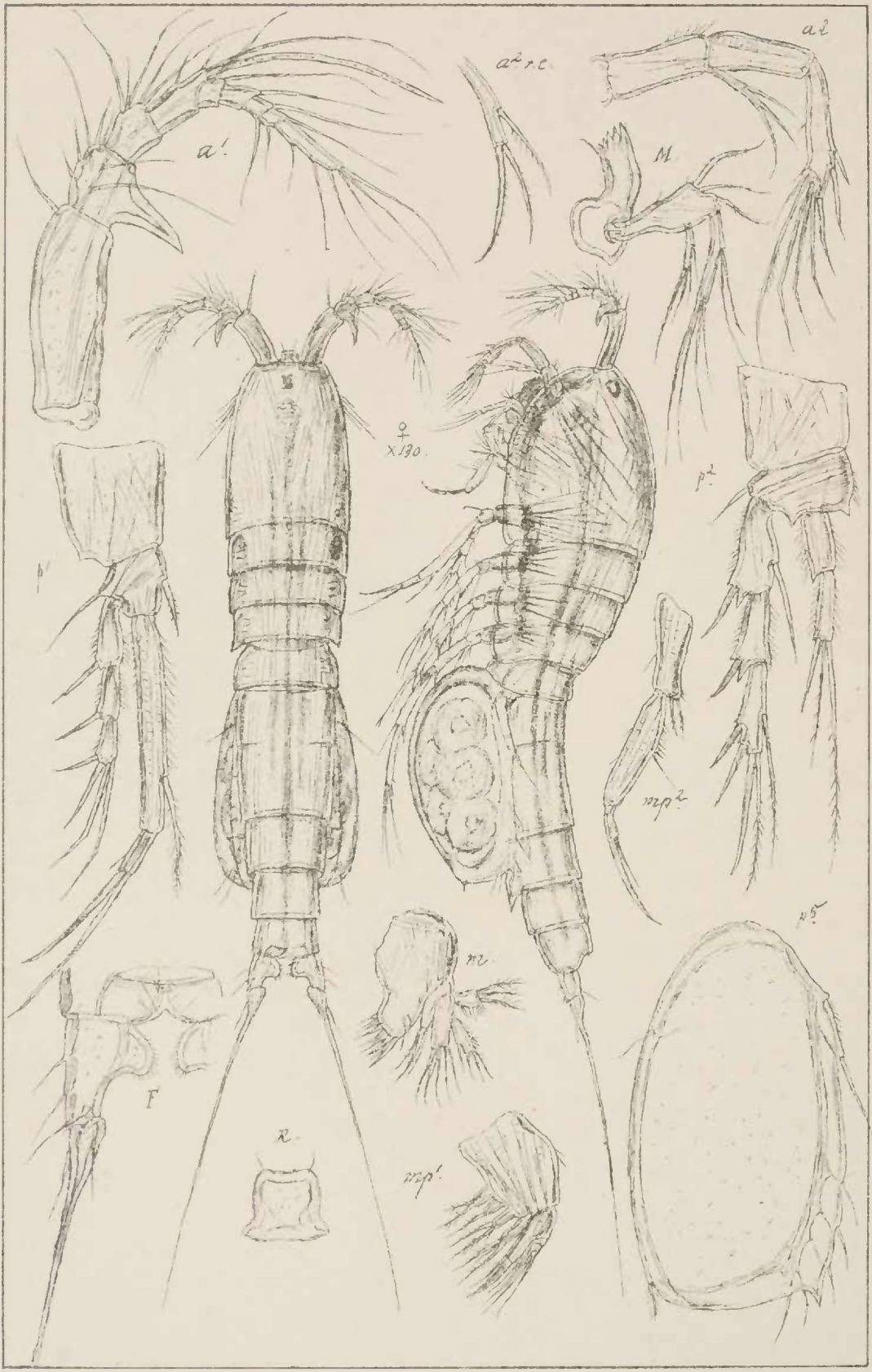
Copepoda

G.O. Sars, autogr. Norsk Litogr. Officin.

Stenocopia setosa G.O.Sars.

(continued)

Copepoda



G. O. Sars. autogr

Norsk Litogr. Officin.

Phyllopodopsyllus Bradyi (Scott)

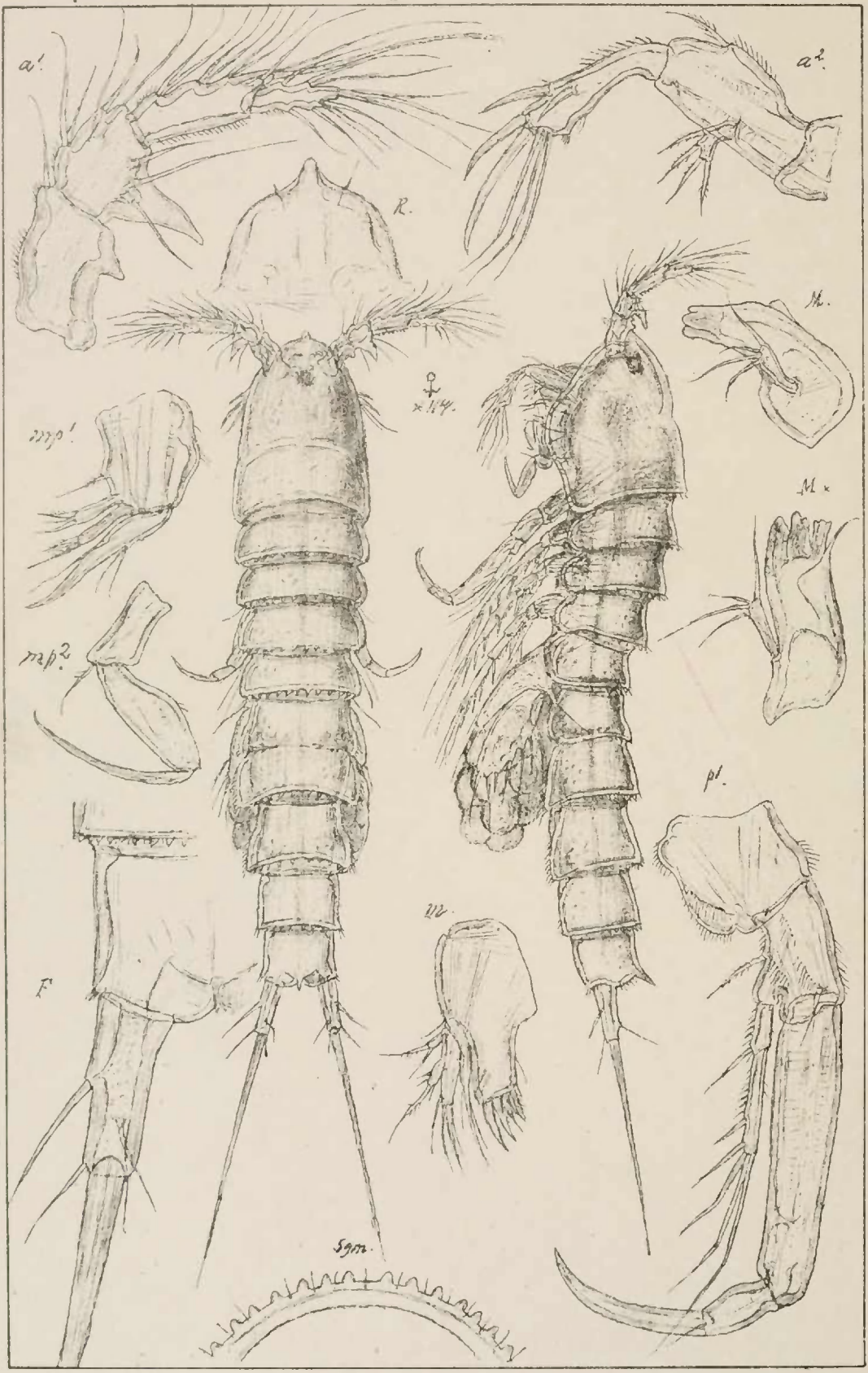
Copepoda

C. O. Sars, autogr. Norsk Litogr. Officin.

1. Phyllopodopsyllus Bradyi Scott (continued)

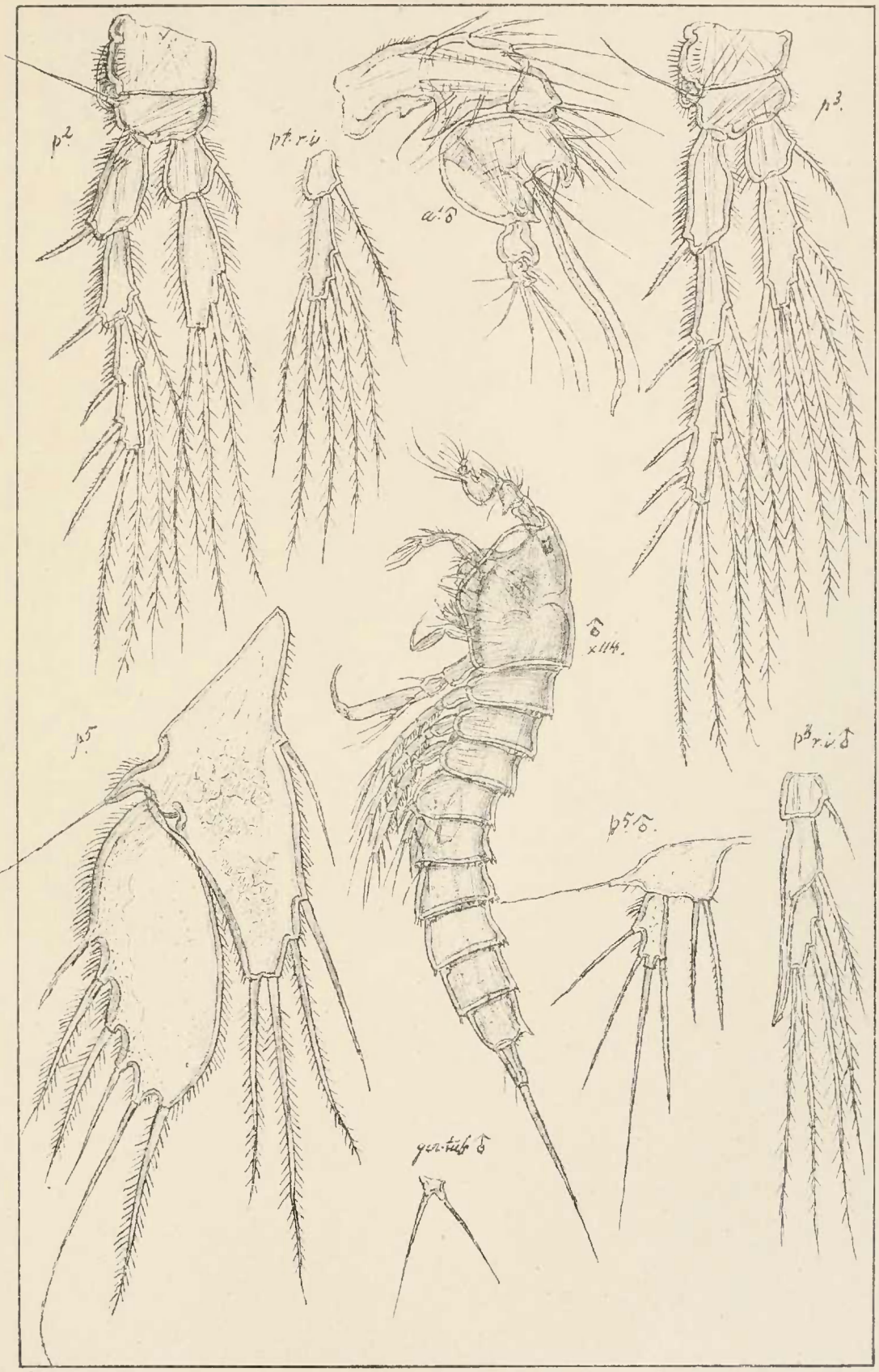
2. " furcifer G.O.Sars

Copepoda



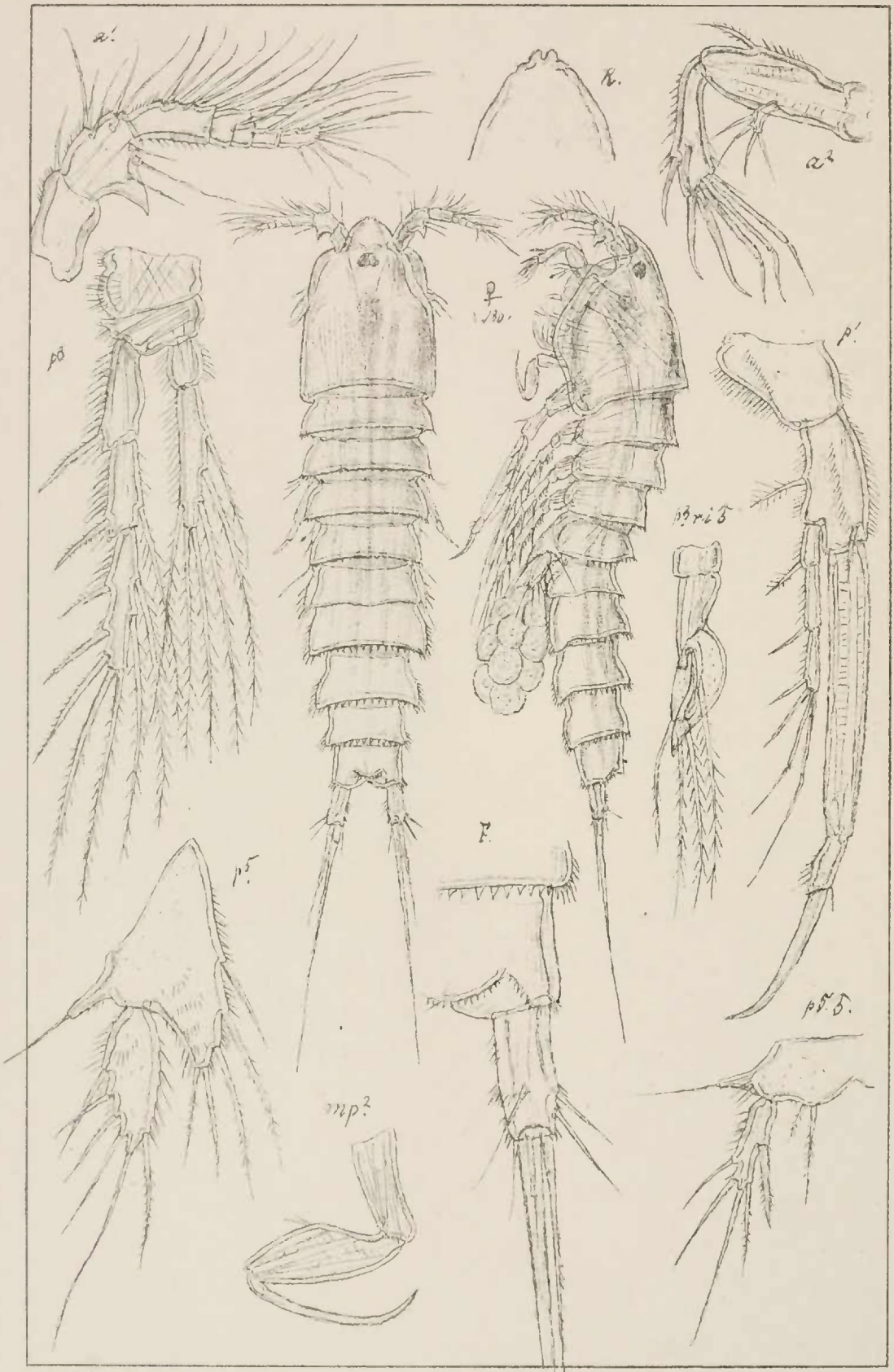
G.O. Sars, autogr. Norsk Litogr. Officin.

Laophonte cornuta, Phil



G. O. Sars, autogr. Norsk Litogr. Officin.

Laophonte cornuta, Phil
(continued)

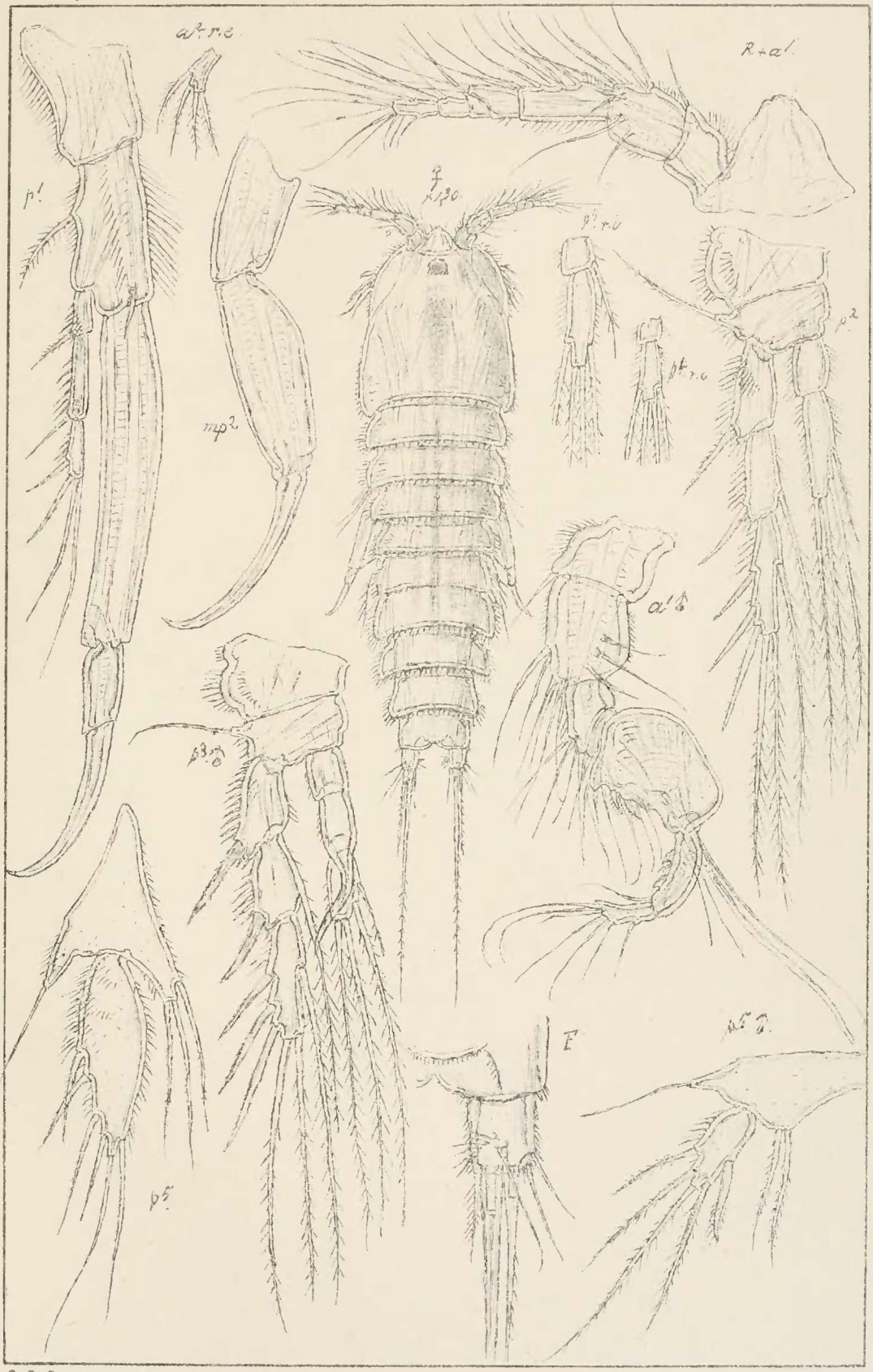


G.O. Sars, autogr.

Norsk Litogr. Officin.

Laophonte serrata (Claus)

Copepoda



G. O. Sars, autogr

Norsk Litogr Officin.

Laophonte depressa, Scott