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[SEVENTH SERIES.]

No. 3. MARCH 1898.

XXIX.—*Descriptions of Three apparently new Copepods from the Clyde.* By THOMAS SCOTT, F.L.S., Naturalist to the Fishery Board for Scotland, and ANDREW SCOTT, Fisheries Assistant, University College, Liverpool.

[Plates X. & XI.]

*Stephos Fultoni**, sp. n.
(Pl. X. figs. 1-8; Pl. XI. figs. 1-4.)

Description of the Female.—Body robust; abdomen moderately slender and composed of four segments, first segment somewhat dilated in the middle; viewed laterally this segment is seen to possess a spiniform and hook-like appendage on the inferior aspect and near the proximal end, while posteriorly there is a distinct fascicle of hairs (Pl. X. fig. 1); the length of the specimen is about 1 millim. ($\frac{1}{25}$ of an inch). The antennules are twenty-four-jointed, as in *Stephos minor*, but the proportional lengths of the joints differ somewhat, as shown by the formula (see also Pl. X. fig. 2)—

Proportional lengths of the joints...	10	13	17	5	5	4	4	6	3	4	4	5	5	5	6	5	5
Number of the joints	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	<hr/>																
	5	5	5	5	6	7	5										
	18	19	20	21	22	23	24										

* In compliment to T. Wemyss Fulton, M.D., F.R.S.E., Superintendent of Scientific Investigations, Fishery Board for Scotland.

The structure of the antennæ and of the mouth-organs resembles generally that of the same appendages in *Stephos gyrans* and *Stephos minor*, though differing in some minor details (Pl. X. figs. 3-5). The first, second, third, and fourth pairs of swimming-feet are also somewhat similar to those of the same two species, but the last three pairs are proportionally rather more slender and elongate (Pl. XI. figs. 1-3). The fifth pair are stout and in general appearance resemble those of the other species, but they differ in the following particulars:—the two members that compose the fifth pair, though nearly equal in length, are somewhat unsymmetrical; in the (?) right foot the end-joint is rather longer than the other and is of a broad knife-like shape, its inner margin is even and nearly straight, while the outer is finely serrated along the posterior half and curved inwards towards the apex; in the (?) left foot the end joint, which is about the same length as the first, is dilated near the proximal end, and after contracting somewhat abruptly on both sides tapers gradually to the extremity, where it terminates in a moderately sharp point (Pl. X. fig. 6).

Description of the Male.—The male does not differ much from the female except in the following particulars:—the abdomen, which consists of five segments, is rather more slender, and the first segment is not dilated. The fifth pair of thoracic feet, though having a general resemblance to those of the males of *Stephos gyrans* and *Stephos minor*, differ very markedly in some of the structural details; in the right foot the first and second joints are subequal and moderately short and slender; the third joint, which is also slender, is of considerable length, being about one and a half times the entire length of the first and second joints; the last joint is long, slender, and strongly falcate, so that it somewhat resembles a reaping-hook, the convex side being outward, the basal part of the joint is also produced inwardly into a process of a triangular form; the left foot terminates in a strongly dilated appendage, which is armed with a large and dark horn-coloured movable claw, distinctly bifid at the extremity; there are also, in addition to the claw, several elongate, flexuous, and spiniform apical processes, as shown in the figure (Pl. XI. fig. 4); it is thus evident that the two members of the fifth pair in the male form together a very powerful and efficient grasping-organ.

Hab. Kilbrennan Sound, Firth of Clyde, 1896; vicinity of Otter Spit, Loch Fyne, 1897.

Remarks.—The fifth pair of thoracic feet in both the males and females of the species now described are distinctly

different from the same appendages in *Stephos minor*, T. Scott, and *Stephos gyrans* (Giesbrecht), and are in themselves quite sufficient to distinguish it from those two species; moreover, it has to be noted that the fifth pair of thoracic feet in the female are scarcely symmetrical, and to that extent they indicate a departure from the normal characters of the genus.

Dactylopus pectinatus, sp. n.
(Pl. X. figs. 9-16.)

Description of the Female.—In general appearance this species is somewhat similar to *Dactylopus Stromii*; the animal is moderately robust, and the length of the specimen figured is about .7 millim. ($\frac{1}{38}$ of an inch). The antennules are short and seven-jointed; the first four joints are stout and subequal in length, but the remaining three are much smaller (fig. 10). The antennæ are short and stout, and the small secondary branches are two-jointed, the end joint being shorter than the other (fig. 11). The mandibles and maxillæ are somewhat similar to those of *Dactylopus rostratus*, so also are the anterior foot-jaws. The posterior foot-jaws are stout and the terminal claws are provided with a fringe of elongate spinules arranged along the inner margin in a pectinate manner, as shown by the figure (fig. 13). The first pair of swimming-feet are moderately stout; the outer branches, which are considerably shorter than the inner, have the first two joints subequal; the end joint is shorter than either of the other two, being little more than half the length of the second; the marginal spines of the three joints are stout and ciliated; the first joint of the inner branches is about one and a half times the entire length of the outer branches, and the end joint, which is very short, is armed with a stout claw, having a comb-like row of elongate spinules along the exterior edge somewhat similar to those on the terminal claw of the posterior foot-jaws; the inner branches appear to be only two-jointed (fig. 14). The following three pairs of swimming-feet are somewhat similar to those of *Dactylopus rostratus* (fig. 15). In the fifth pair the inner produced part of the basal joint is broadly rounded and provided with five terminal setæ, four of which are moderately elongate, and one—the second from the inside—very short; the secondary joint is ovate in outline and about one and a half times longer than broad, and is furnished with six moderately long setæ—one on the inner margin, three on the outer margin, and two, somewhat longer than the others, at the apex (fig. 16). The caudal stylets are shorter than the last abdominal segment.

Male unknown.

Hab. Near the head of Loch Fyne: apparently rare.

Remarks.—This species was obtained early in 1896 among some “refuse” trawled between Lowburn and Cairndow, near the head of Loch Fyne. The remarkable series of comb-like spinules on the terminal claws of the first pair of swimming-feet arrested the attention at the very outset; the creature had only to be turned on its side under the microscope to bring this character prominently into view; on dissecting the animal it was found that the terminal claws of the posterior foot-jaws were also furnished with a similar series of spinules: these peculiarities in the armature of the appendages referred to, along with differences in the structure of the antennules and of the fifth pair of thoracic feet, separate this from any other species of *Dactylopus* known to us. We would also point out that, though this species has many of the characters of a true *Dactylopus*, the structure of the first pair of swimming-feet is somewhat abnormal—for example, the middle joint of the outer branches is scarcely longer than the first, while the inner branches are apparently only two-jointed; and it may hereafter, for this reason, be considered necessary to remove it to another genus, but meantime we prefer to leave it where it is.

Eurynotus * *insolens*, gen. et sp. n.
(Pl. X. fig. 17; Pl. XI. figs. 5-13.)

Description of the Female.—Length .8 millim. ($\frac{1}{30}$ of an inch). Body robust; the thorax seen from above is broadly ovate and indistinctly divided into two unequal segments, the division of the segments being indicated by a slight flexure on each side; the anterior segment is about two thirds the length of the other and slightly wider; the forehead is broadly and more or less evenly rounded. The abdomen is composed of four segments; the first is somewhat dilated, but the others are comparatively slender, and the caudal stylets are about equal in length to the last abdominal segment; the entire length of the abdomen and caudal stylets is scarcely equal to half the length of the thorax (Pl. XI. fig. 5). The antennules are seven-jointed, short and stout, and taper gradually towards the extremity; the second joint is much longer than any of the others, and besides being furnished with several small hairs it carries a long plumose seta near the distal end of the lower margin (Pl. XI. fig. 6). The following are the proportional lengths of the joints—

Proportional lengths of the joints..	28	48	20	14	10	7	10
Number of the joints	1	2	3	4	5	6	7

* Gr. Εὐρύνωτος, having broad shoulders.

The antennæ are stout and apparently four-jointed, and are provided with several terminal setæ; two of these setæ are elongate and slightly hooked, while other two terminate in what appear to be rounded disks, as shown by the figure (Pl. XI. fig. 7); the antennæ do not appear to be furnished with secondary branches. The mandibles are elongate slender appendages that terminate in hook-like extremities and are furnished interiorly near the middle with two long marginal setæ (Pl. XI. fig. 8). The maxillæ are very rudimentary, each being little more than a short stout tubercle bearing two small hairs (Pl. XI. fig. 9). The anterior foot-jaws, which are also rudimentary, are short, stout, and somewhat triangular in outline, and are one-jointed and provided with two terminal setæ (Pl. XI. fig. 10). The posterior foot-jaws are apparently two-jointed, the first joint being comparatively large and dilated interiorly, so as to assume a gibbous form and having a considerable portion of the interior surface clothed with minute spines; the second joint is very small and armed with three unequal setæ, as shown by the figure (Pl. XI. fig. 11). So far as can be made out there appear to be only three pairs of thoracic feet; the first and second pairs are somewhat similar in structure; the basal joints of each foot are two in number and very stout, the second of the two basal joints carries two branches, which are comparatively wide apart; the inner branches are composed of two and the outer of three joints, and both are moderately slender; the armature of the inner branches consists of three terminal setæ, the exterior one being short, while the other two are elongate and plumose; four elongate setæ spring from the inner margin of the outer branches, one from the second joint and three from the last; the exterior marginal setæ are short (Pl. XI. fig. 12). The third pair of feet are apparently only one-branched, the outer branches being developed, while the inner are obsolete; these outer branches are two-jointed and articulated to the upper part of the distal extremity of the stout second basal joints (Pl. XI. fig. 13). There appear to be no fourth or fifth pairs. The ovisacs form elongate cylinders and appear to contain a single series of large ova. Situated between and a little in front of the mandibles is a large circular appendage, which from its peculiar structure is probably a sucking-disk for enabling the Copepod to adhere more securely to the creature that forms its host; but whether that is its only function we are unable to say. This appendage is represented by figure 17, Pl. X.

Male unknown.

Hab. Kilbrennan Sound, Firth of Clyde, 1886; apparently rare.

Remarks.—The Copepod of which the above is a description does not resemble any described species known to us; we are also unable for the present to ascribe it to any known genus, and the name we have applied to it refers to its somewhat anomalous structure and position. The peculiar form of the thorax of this Copepod was the feature that first attracted attention to it, and the subsequent examination and dissection of it revealed the abnormal character of the species. It is a Copepod that appears to be either a parasite or a commensal.

EXPLANATION OF THE PLATES.

PLATE X.

Stephos Fultoni, sp. n.

Fig. 1. Female, lateral view, $\times 40$. 2. Female antennule, $\times 76$. 3. Antenna, $\times 63$. 4. Mandible and palp, $\times 95$. 5. Anterior foot-jaw, $\times 95$. 6. Fifth pair of thoracic feet, female, $\times 304$. 7. Abdomen of female, $\times 80$. 8. Abdomen of male, $\times 80$.

Dactylopus pectinatus, sp. n.

Fig. 9. Female, dorsal view, $\times 64$. 10. Female antennule, $\times 190$. 11. Antenna, $\times 304$. 12. Anterior foot-jaw, $\times 304$. 13. Posterior foot-jaw, $\times 380$. 14. Foot of first pair of swimming-feet, $\times 250$. 15. Foot of fourth pair, $\times 120$. 16. Foot of fifth pair, $\times 380$.

Eurynotus insolens, gen. et sp. n.

Fig. 17. Sucker-disk.

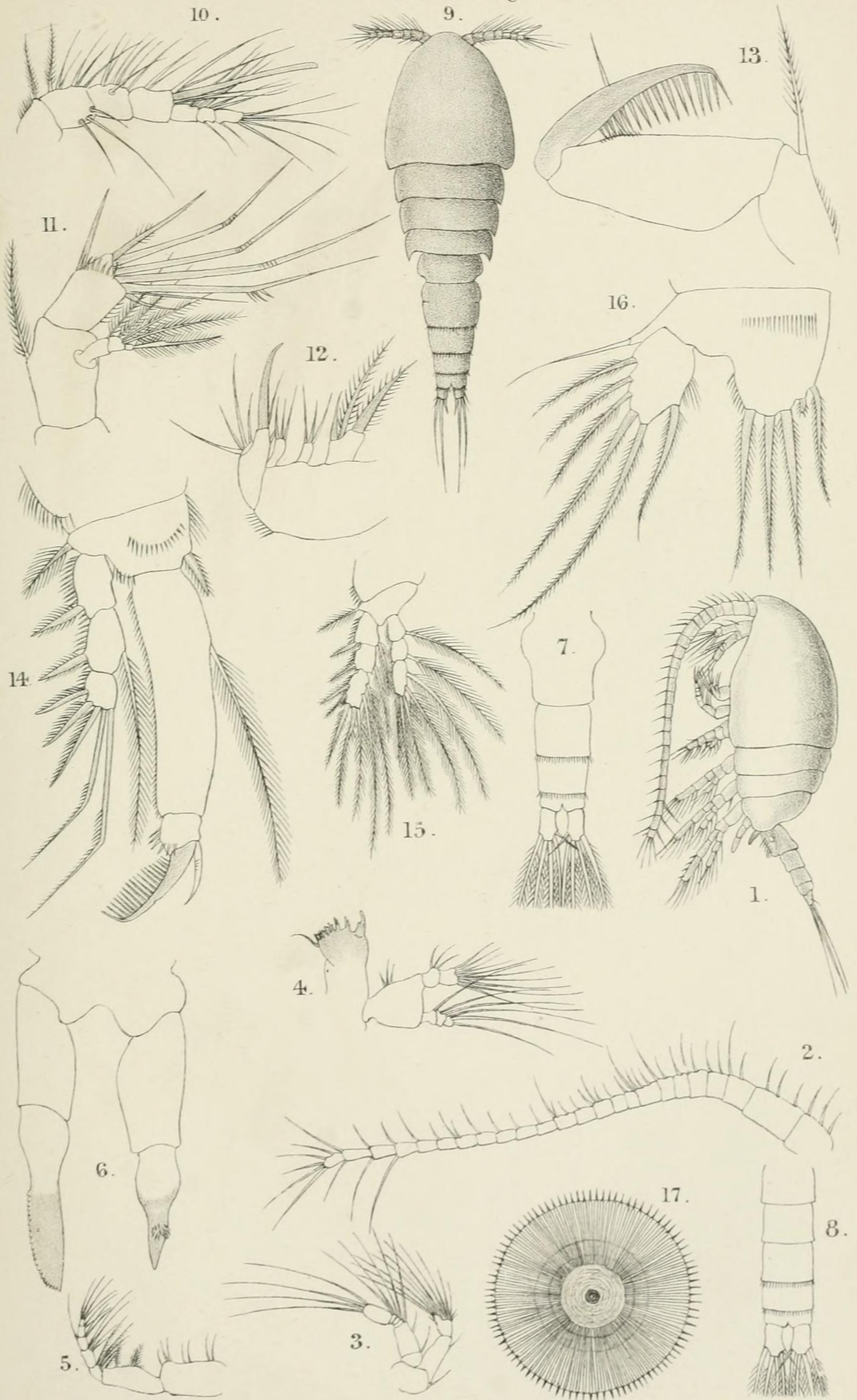
PLATE XI.

Stephos Fultoni, sp. n.

Fig. 1. Foot of first pair of swimming-feet, $\times 125$. 2. Foot of second pair, $\times 125$. 3. Foot of fourth pair, $\times 125$. 4. Fifth pair of thoracic feet, male, $\times 152$.

Eurynotus insolens, gen. et sp. n.

Fig. 5. Female, dorsal view, $\times 80$. 6. Antennule of female, $\times 190$. 7. Antenna, $\times 304$. 8. Mandible, $\times 380$. 9. Maxilla, $\times 760$. 10. Anterior foot-jaw, $\times 304$. 11. Posterior foot-jaw, $\times 380$. 12. Foot of first pair of swimming-feet, $\times 190$. 13. Foot of third pair, $\times 190$.

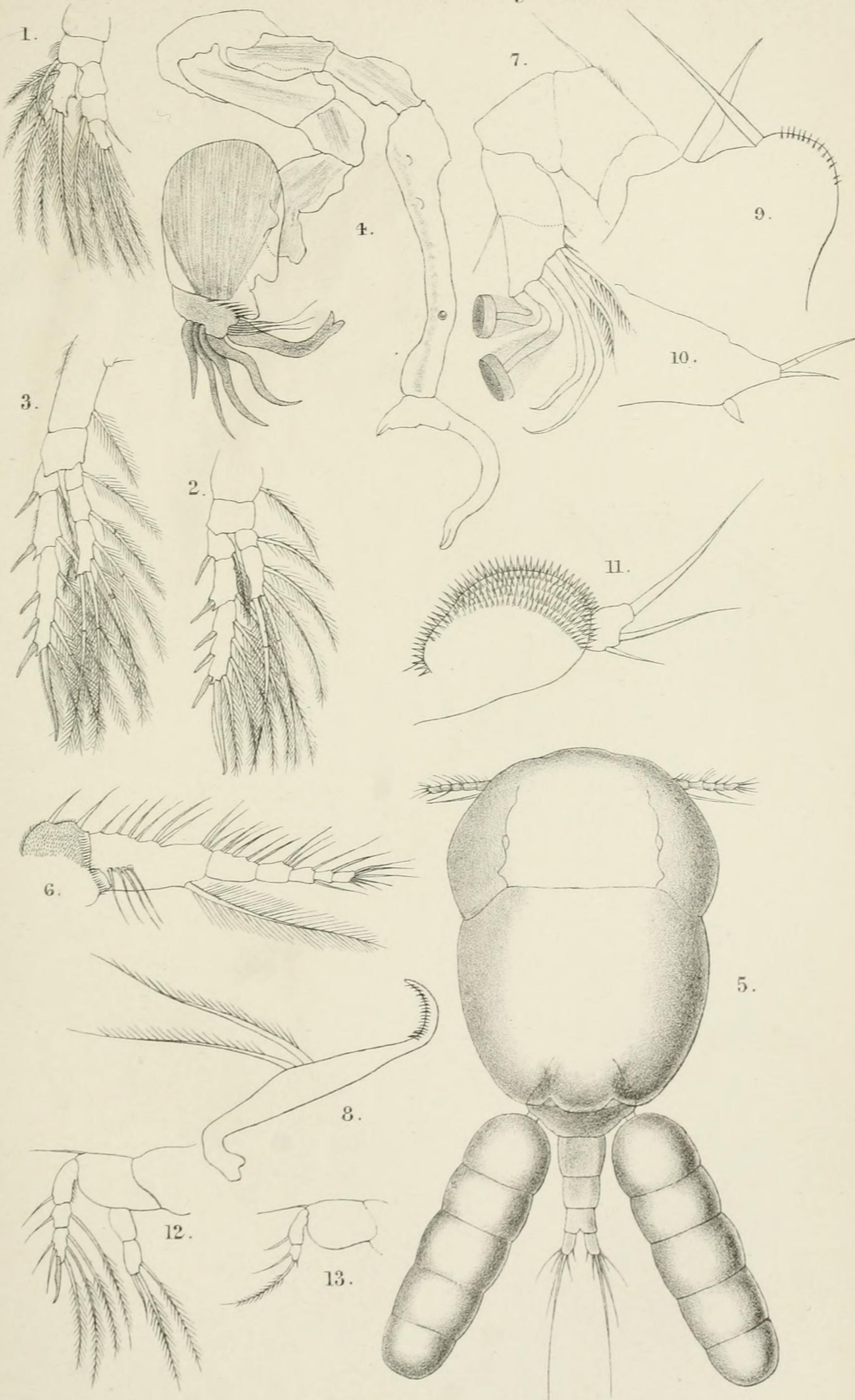


A. Scott del. ad nat.

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FIGS. 1-8 STEPHOS FULTONI sp.n. FIGS. 9-16 DACTYLOPUS PECTINATUS . sp.n.

FIG. 17 EURYNOTUS INSOLENS n.g. & sp.



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FIGS.1-4 STEPHOS FULTONI sp.n.
FIGS.5-13 EURYNOTUS INSOLENS ng&sp.