ENTOMOSTRACA.—*By George Stewardson Brady, M.D., F.L.S., C.M.Z.S.*

(Plate XII.)

[OSTRACODA.

All of the *Ostracoda* collected by me in Kerguelen Island were lost by a breakage.—A. E. E.]

COPEPODA.

The Entomostraca submitted to me were taken in the following localities:—One surface-net gathering, in lat. 35° 9′ S., long. 45° 30′ E.; another gathering from a freshwater lake, and a third from a pool above high-water mark, both in Kerguelen Island. The oceanic species were *Calanus finmarchicus* and a *Sapphirina*, either identical with or very closely allied to *S. danæ*, Lubbock; those from Kerguelen Island were a freshwater species, apparently new, described by me briefly in Ann. and Mag. Nat. Hist., Sept. 1875, under the name *Centropages brevicaudatus;* and a species from brackish water, *Harpacticus fulvus*. No species have yet been recorded by the other Expeditions.

Harpacticus fulvus, *Fischer*.

Hab.—Royal Sound, Kerguelen Island; abundant in pools above high-water mark. It was first noticed by Mr. Eaton at the American station (Molloy Point), in pools by the landing place; but the specimens preserved came from Observatory Bay.

The occurrence of this species in Kerguelen Island is particularly interesting from the fact that it is found all over the European shores in precisely similar situations, that is to say in brackish pools, at or above high-water mark, which are liable to become warm through exposure to the sun's rays. These are in no respect distinguishable from European specimens.

Centropages brevicaudatus, *Brady*.

Centropages brevicaudatus, Brady, Ann. & Mag. Nat. Hist., ser. 4, Sept. 1875, vol. xvi. 162; Eaton, op. cit., vol. xvii. p. 264.

Long. ♀ $\frac{1}{10}$ inch. *Male* not observed. *Female* robust, rostrum short and blunt, last segment of cephalothorax produced on each side into an acutely angular oblong ala-form process. Upper antenna as long as the first two segments of the

cephalothorax, slightly tapering towards the extremity, beset with short setæ, 25-jointed; joints subequal, somewhat increasing in length as far as the penultimate joint. Lower foot-jaw rather short, of moderate strength, armed at the apex with two slender falcate claws. The other mouth organs present no distinctive peculiarities. Swimming-feet with both of their branches 3-jointed, the inner branch short; first pair much smaller than the next three, with the terminal spines of the outer branch smooth, and of moderate length and strength; fifth pair with the second joint of the outer branch produced internally into a strong denticulated spine, and the marginal setæ of both of the branches extremely short. Abdomen short, composed of two segments exclusive of the caudal segments; the vulva forms a large rounded protuberance on the first segment; the caudal setæ are short, subequal, half as long as the abdomen, and plumose.

Hab.—This species is very plentiful in freshwater lakes in the neighbourhood of Observatory Bay. It swims slowly, and with an even motion; and hence the females have the appearance of small brown seeds borne along with the water. Their abdomen is somewhat jecinoreus in colour, paler than the cephalothorax. By some accident they were at first stated to be oceanic (Ann. & Mag. Nat. Hist., Sept. 1875), but the tube containing the specimens bore a record of their true habitat, and this statement was afterwards corrected (op. cit. March 1876). No males were preserved.

Plate XII., figs. 11—19, *C. brevicaudatus* ♀ (enlarged): 11, female (side view); 12, upper antennæ; 13, mandible and palp; 14, maxilla; 15, upper foot-jaw; 16, lower foot-jaw; 17, a swimming-foot of the 1st pair; 18, one of the 5th pair; 19, abdomen.

Calanus finmarchicus, *Gunner*.

Cetochilus septentrionalis, Goodsir, Edinb. New Phil. Journ. 35, p. 339, Pl. vi., figs. 1–11; Baird, Nat. Hist. Brit. Entom., p. 235, T. xxix., figs. 1 *a–g*.

Hab. and Dist.—Two specimens were taken in the surface-net in lat. 35° 9′ S., long. 45° 30′ E. It is found also in the British, European, and Greenland seas.

Sapphirina danæ, *Lubbock*.

Trans. Ent. Soc. London, N. S. 1856, vol. iv., part ii., p. 23, pl. xii., 9–11.

Dimensions ♂ $\frac{15}{100}$ inch long, $\frac{7}{100}$ inch broad; ♀ $\frac{14}{100}$ inch long, $\frac{4}{100}$ inch broad.

Male.—Outline from above sub-elliptical, rather widest in front; first cephalothoracic segment considerably broader than long, equal in length to the four following conjoined. Superior antennæ short, stout, moderately setose, 5-jointed, with the second joint about as long as the four others united; inferior antennæ somewhat longer, 4-jointed, geniculated between the second and the third joints; first and second joints by far the longest, third very short, fourth long, terminated

by a small claw and a bristle about as long as the claw. Mandible (?) slender, with a single apical tooth and two stout plumose lateral filaments; no palpi. Upper foot-jaw short and stout, 3-jointed, ending in a simple claw; lower foot-jaw larger, stout, 3-jointed, bearing a large curved apical claw which is fully as long as the three preceding joints taken together. Swimming-feet in four pairs, all nearly alike, 2-branched, the branches 3-jointed and subequal in length to each other; marginal spines of the outer branch sharp and slender, the other setæ of moderate length and very distinctly plumose. Caudal laminæ ovate, about twice as long as wide, armed with 4 very short setæ, of which two are apical, one is on the middle of the outer margin, and the fourth is intermediate between this and the other two; at the extremity of the inner margin is a minute spine.

In the median line, behind the bases of the first pair of antennæ, is a very distinct nervous mass in the form of a ganglionic ring elongated backwards, which emits numerous diverging lateral filaments, and separates posteriorly into two large nerve trunks. From the front of this ganglion are given off two short processes, supporting at their extremities two bulb-like "conspicilla" or lenses, slightly in advance of which are two nebulous spots which seem to be of the nature of "ocelli."

Behind the bifurcation of the cephalo-thoracic ganglion lies a glandular organ of considerable size, covering the upper portion of the alimentary canal; and from it, or from its immediate neighbourhood, two curved tubes are prolonged backwards to the sixth body-segment, where they converge towards the intestinal tube and terminate in cœcal expansions; these are the "vasa deferentia."

The alimentary canal is a straight funnel-shaped tube, which extends along the median line to the apex of the abdomen.

Female.—Very different in shape from the male; the abdomen being abruptly narrower than the cephalothorax. Cephalothorax of 4 segments, the first of which is as long as the three remaining together. Abdomen 6-jointed (exclusive of caudal segment), only about half as wide as the cephalothorax, from which it is separated very distinctly. The first segment is constricted anteriorly, and gives attachment to the last (fifth) pair of feet; these feet are rudimentary, and consist of a single joint armed with two terminal setæ. The other abdominal segments are about twice as broad as long, and are subequal to one another. The caudal segments are rather wider in proportion than those of the male.

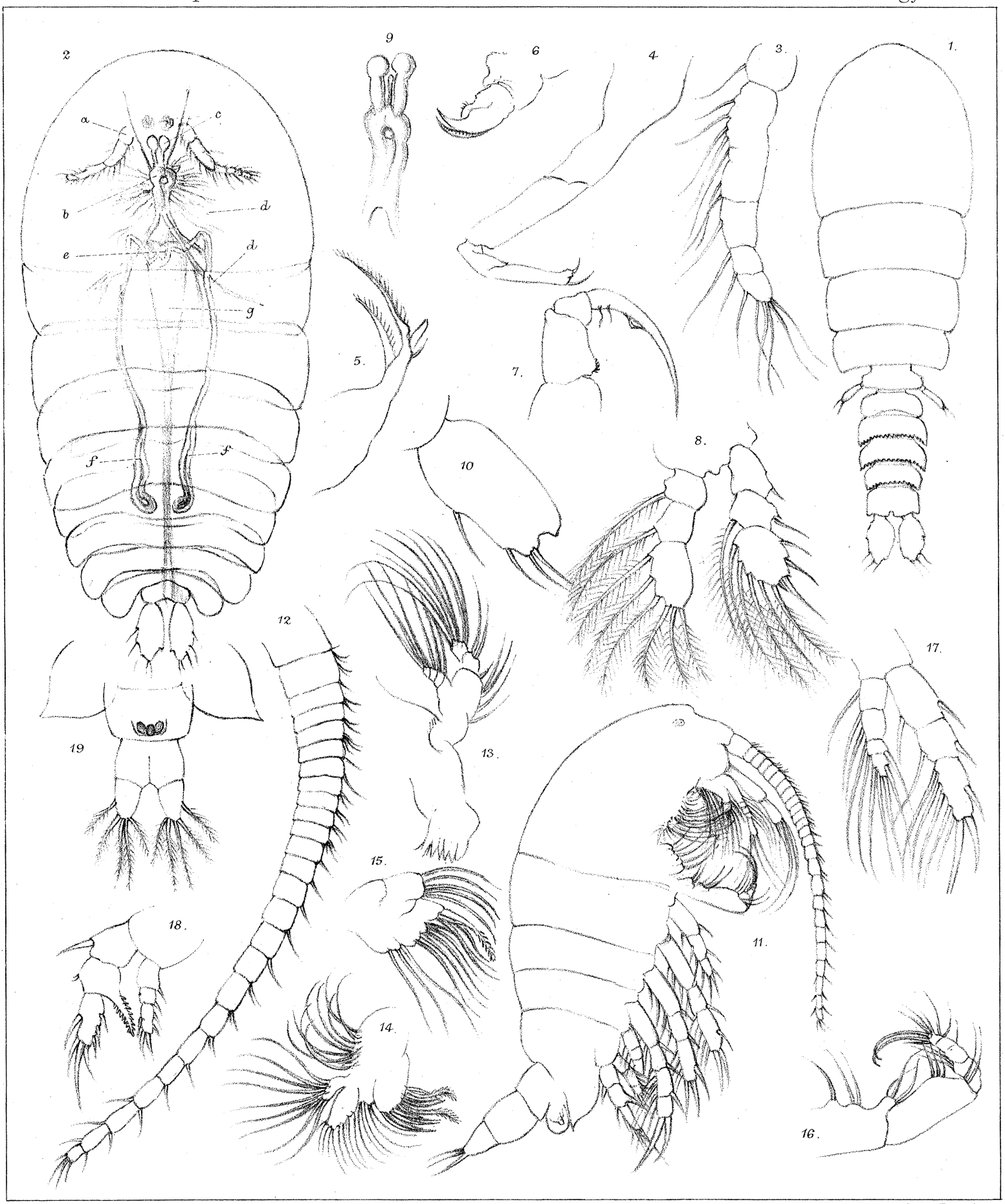
Hab.—Taken by the surface-net in Lat. 35° 9′ S., Long. 45° 30′ E., March 1875 (Eaton); Lat. 27° 30′ N., Long. 20° W. (Lubbock). A very similar species, perhaps the same, was obtained by Mr. Eaton on the 25th of September 1874 on his outward voyage, within 60 miles W. of the Crozets; but none of this earlier gathering could be preserved.

Mr. Eaton says of this species :—

"The large oval flattened Entomostraca in the water reflected from their surface a blue light which changed to opal in certain positions, and were conspicuous like phosphorescent spots from the deck of the vessel. The colour was entirely due to reflection, their actual substance being colourless and diaphanous. They swam back downwards, and occurred mostly in narrow bands of brownish water, some of which from 50 to 200 yards in width extended for miles as far as we could see on both sides of us. The water derived its tint from jelly-like granulated oval flattened disks easily injured by removal from the sea, which resembled in appearance spawn of Mollusca; but having nothing better than a Coddington lens at hand to examine it with, I am unable to vouch that it was spawn. There were also various kinds of small jelly-fish in some of the bands,—here and there a miniature *Velella* of ultra-marine blue,—most of them the produce of Sertularians; and the brilliant Entomostraca entangled in their trailing tentacles could be distinguished from among the others by the constancy with which their position relative to one another was maintained. As a rule these cœlenterata did not contribute largely to the formation of the bands, although they were abundant; but now and then bands were crossed by us which consisted of little besides these Acalephæ. When it is considered that the individual jelly-fish are colourless, with the exception of their proboscis (when there is one), eye-specks, and ovaries,—so transparent indeed that often eye-specks are the only parts of them visible in a white basin—the difficulty of conceiving the innumerable myriads of them in a strip of water miles in length coloured brown by them alone, may be imagined. The *Sapphirinæ* are less plentiful in these bands than they are in those which are due to the 'spawn.' The smaller Entomostraca were mostly of a beautiful ultramarine blue."

The small form here referred to is, I presume, the female, as the gathering sent to me contains no other species except *Calanus finmarchicus*, which, so far as I know, never exhibits any bright colouring. These Sapphirinæ even after their preservation in spirits with glycerine present a very vivid opalescence.

Plate XII., figs. 1–10, *S. danæ* (enlarged); 1, female (from above); 2, male (from beneath); 2*a*, upper antennæ; *b*, cerebral ganglion; *c*, lenses; *d* and *d*, nerve filaments; *e*, testis; *f* and *f*, vasa deferentia; *g*, alimentary canal; 3, upper antenna ♂; 4, lower ditto; 5, mandible (?); 6, upper foot-jaw; 7, lower ditto; 8, a swimming-foot of the first pair; 9, cerebral ganglion with lenses; 10, caudal lamina ♀.



G. B. Sowerby lith. Mintern Bros. imp.

1—10. Sapphirina danæ
11—19. Centropages brevicaudatus.