of the new species of what may be a vestige of the inner flagellum. The only Isopoda in which any trace of this flagellum has been found hitherto are the gigantic *Bathynomus* and the cryptoniscan larvæ of some Epicaridea.

EXPLANATION OF PLATE V.

Fig. 1. *Chelura insulæ*, ovigerous female, from the side.
Fig. 2. Ditto. Posterior part of body, from above.
Fig. 3. „ Gnathopod of first pair.
Fig. 4. „ Gnathopod of second pair.
Fig. 5. „ Pleopod of second pair.
Fig. 6. „ Adult male, from the side.
Fig. 7. *Limnoria andrewsi*, female, from above.
Fig. 8. Ditto. Antennule. * Supposed vestige of inner flagellum.
Fig. 9. „ Antennæ.
Fig. 10. „ Mandible.
Fig. 11. „ Maxilliped.
Fig. 12. „ Gnathopod of first pair.
Fig. 13. „ Terminal part of same, further enlarged.
Fig. 14. „ Uropod.

XXVII.—*Notes on the Choanoflagellate Genera* Salpingœca *and* Polyœca, *with Description of* Polyœca dumosa, *sp. n.*

By J. S. Dunkerly, B.Sc., Assistant in Zoology Department, Birkbeck College, London.

[Plates VI. & VII.]

The Choanoflagellata have been little studied of late, and after observing several freshwater forms, I spent a month of 1909 at the Plymouth Biological Station, in order to obtain some knowledge of the marine members of the family. I should like here to express my sincere thanks to the British Association for the Advancement of Science for permission to use their table, and also to the staff of the Laboratory for their kind assistance. My work on these forms has received the kindest encouragement and assistance from Professor Minchin, who has allowed me to work at the Lister Institute.

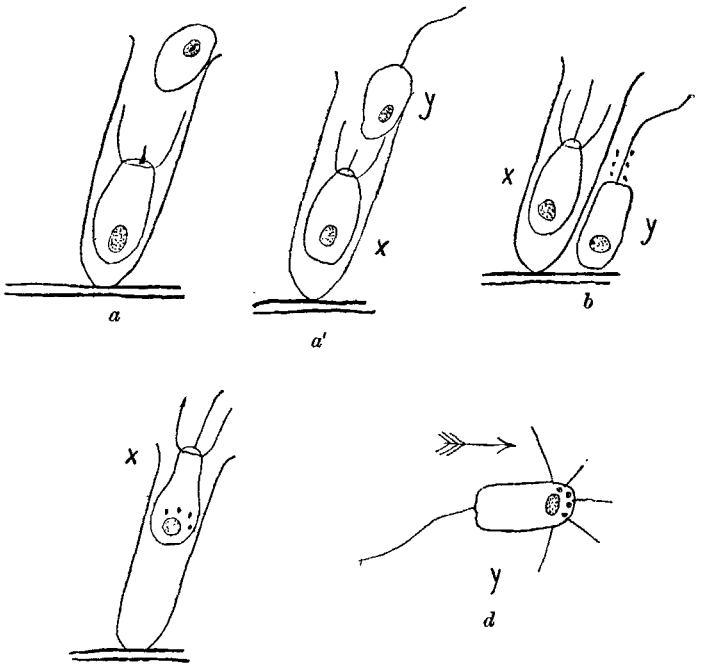
Salpingœca.

Salpingœca was established as a genus by James Clark (1), and Saville Kent discovered a large number of different forms. That all of Saville Kent's so-called species are truly such is more than doubtful: *e. g.*, Francé has pointed out that Kent's figures of *Monosiga ovata* (2, pl. II. fig. 33) and *M. consociata*

(*ibid.* pl. IV. fig. 19) are practically identical. Most of the species of *Salpingœca* admitted by Francé I have seen; one species, the beautiful *S. ampulla*, had not been seen apparently by Francé, the latest monographer of the group.

The commonest species at Plymouth is *S. vaginicola*, which has a very elongate lorica. In this species, which is large, the blepharoplast, which has been seen in *S. amphoridium* by Burck (5), is distinct in preparations stained with carmalum or iron hæmatoxylin (Pl. VI. figs. 1 & 2). Certain interesting results of division were seen (text-fig. 1, *a–d*) in this

Fig. 1.



Division (late stages) of *S. vaginicola*. In *d* arrow shows direction of movement. (Diagrammatic.)

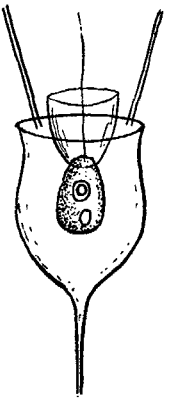
species. At *a'* the two products of division are seen in the same lorica, and it may be noted that the lower individual (x) which at this stage possessed collar and flagellum, is situate in the lower portion of the lorica. The upper individual (y),

which had one flagellum, but no collar, was seen to move slowly away and to settle down as at *b*. After ten minutes it moved slowly away, with its flagellum trailing as a pulsellum (*d*). At this stage **x** had moved up to near the mouth of its lorica, the customary situation (*c*) ; apparently the animal descends in its lorica for the purpose of division. The free individual (**y**) was observed for an hour to be moving slowly about with feeble movements of its flagellum. Extremely fine pseudopodia were seen at times to be extruded from the aflagellate region of the body (*d*). These may serve as attaching processes when the animal settles down, but the particular individual was unfortunately lost at this stage.

Polyœca.

Polyœca dichotoma (text-fig. 2) was the name given to a species of Choanoflagellata found by Saville Kent in a marine tank at the Crystal Palace in 1874. Since that time it has not been recorded, neither Francé (4) nor Bütschli (3) having

Fig. 2.



Polyœca dichotoma (after Saville Kent).

seen it. Francé admits it as a genus in his monograph (*loc. cit.*), but writes :—"Diese eigentümliche Art, . . . wurde in den letzten 23 Jahren von Niemandem wiedergefunden."

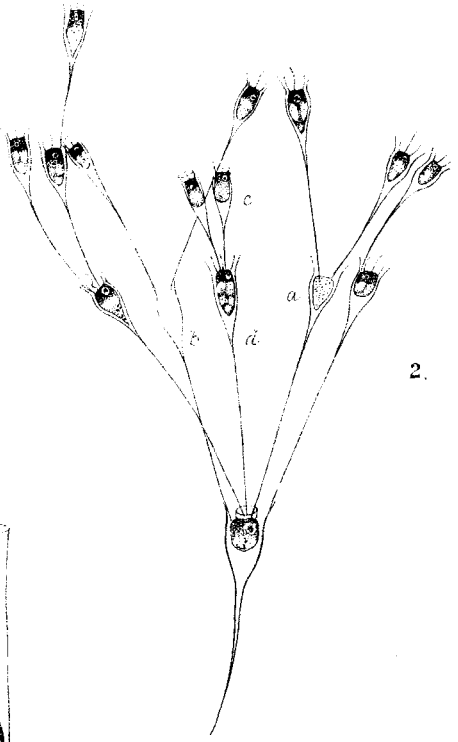
I found a form obviously answering to Kent's description of this genus quite abundant in a tank at Plymouth Marine Biological Station in August 1909, but have not succeeded in finding it in material from outside.

My drawings and preparations show that, in colony formation and in the shape of lorica, the specimens seen by me differ considerably from those shown in the figures of S. Kent. I am reluctant to establish a new species name in this little-known group, but unfortunately S. Kent's specific name of *dichotoma* would be a positive misnomer for this form. It will be seen (Pl. VI. fig. 2) that from one basal individual as many as five daughter individuals may arise. The form of the lorica is very different from that shown in Kent's figures, the base tapering down very gradually; also the body nearly fills the lorica, whereas Kent shows the body as being about one-half the width of the lorica. The stalk of *Polyœca dichotoma* is shown as branching by Kent. I believe that this was an error of interpretation. Certainly I have never found a stalk branching in my species, although, without careful observation, the crossing of two stalks (Pl. VI. fig. 2) might easily be mistaken for such. Under these circumstances I am compelled to distinguish this species from that of Kent, and, from the bushy form of full-grown colonies, the name *Polyœca dumosa* would appear to be suitable.

The form is very small, the lorica being 10·5 μ in length and 4·5 μ in breadth, while the cell itself is only 6 μ long and 4 μ broad. The flagellum is at least twice as long as the cell-body and is generally in movement along its whole length. The collar is usually very well expanded (Pl. VII. figs. 3 & 4). It is worthy of note that in most of the marine forms seen by me the collar was expanded into the cup-shaped form which Kent always depicts. This is not the case with freshwater forms, or rarely so, the collar being in them more cylindrical in shape. Francé, being more familiar with freshwater forms, was led by this fact to remark that "nur in ganz vereinzelten Fällen ist das Collare tatsächlich glockenförmig," but, in the majority of cases, Kent's figures are probably correct in this respect, as he worked a great deal with marine Choanoflagellata.

The nucleus, not shown in most of Kent's figures of *P. dichotoma*, is seen in preparations stained with carmalum or treated with iodine solution (Pl. VII. figs. 5 & 6). Although very obscure, it can be seen near the base of the flagellum. Like most of the nuclei in Choanoflagellata, it consists of a round evenly staining body, with a central deeply staining karyosome. I have not seen a blepharoplast clearly.

The main interest of this form lies in its faculty for colony formation. Division occurs as described above for *Salpingœca*, the two resulting cells lying somewhat obliquely in the cell (text-fig. 3). The difference between *Salpingœca* and

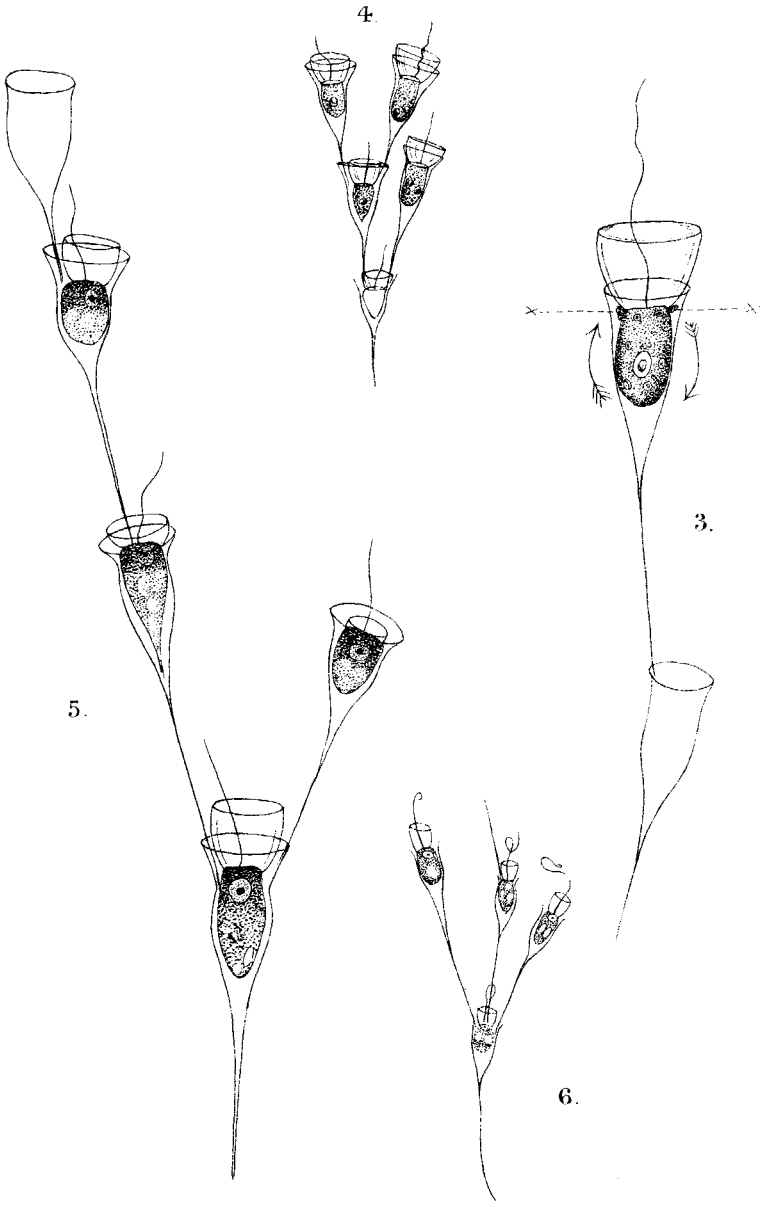


2.

1a.

1b.

J. Green lith.



J. Green lith.

Polycœca is that the daughter individual in *Polycœca* erects its lorica on the mouth of the mother individual's lorica, instead of swimming away and settling elsewhere.

The excessively attenuate base of the lorica in *Polycœca* leads one to imagine that the length of stalk, in this form at least, is due to the gradual increase in area of that part of

Fig. 3.

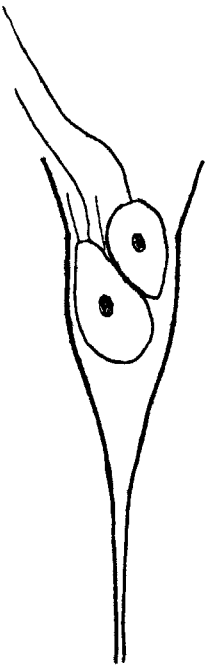


Fig. 4.

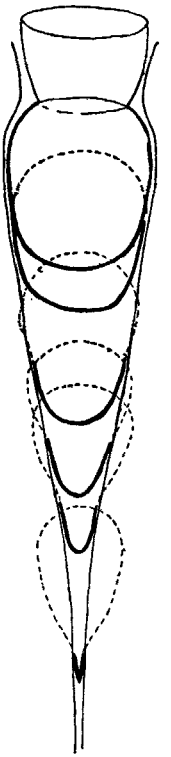


Fig. 3.—Division of *P. dumosa* (late stage).
Fig. 4.—Diagram showing mode of formation of lorica in *P. dumosa*.

the cell which is capable of secreting the material for the formation of the lorica. A diagram (text-fig. 4) shows what may happen in such cases. The successive stages of growth of the cell are shown, and the secreting area in each case is in continuous line, the rest of the cell-outline being dotted. The form of the *P. dumosa* lorica suggests this mode of forma-

tion of the stalk, and on purely *à priori* grounds it would be unlikely for a cell to grow out unprotected on a long stalk, and *then* to form a protective lorica. On the other hand, it is difficult to see how, the lorica being once formed, the stalk could be elongated by a cell situate within the lorica. However, the mode of secretion by similar stalked forms is little understood, but this explanation suggested itself to me after continued comparisons of the younger and older members of a *P. dumosa* colony (Pl. VI. fig. 2, *c* and *d*).

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(1) James Clark. "On Spongiæ Ciliatæ." Mem. of Boston Soc. Nat. Hist. vol. i. pt. 3. 1867.
(2) Saville Kent. Manual of the Infusoria. 1881–82.
(3) Bütschli. "Protozoa Flagellata" in Bronn's 'Thierreich,' Bd. i. Abth. 2. 1883–87.
(4) R. Francé. Der Organismus der Craspedomonaden. 1897.
(5) Carl Burck. "Studien über einige Choanoflagellaten." Arch. f. Protistenkunde, Bd. xvi. Heft 2. 1909.

EXPLANATION OF PLATES VI. & VII.

Fig. 1 *a*. *Salpingœca vaginicola.* Flemming—Fe hæmatoxylin. Individual with long lorica.
Fig. 1 *b*. Ditto. Osmic 4 per cent.—carmalum.
Fig. 2. *Polyœca dumosa*, sp. n. Colony, showing method of growth. *a*, degenerating individual in its lorica; *b*, empty lorica; *c*, young individual with short stalk and narrow lorica; *d*, older individual with longer stalk and wide lorica.
Fig. 3. Single individual of *P. dumosa*, drawn living. Arrows show direction of current of food-vacuoles.
Fig. 4. Colony of *P. dumosa*, drawn living.
Fig. 5. Part of colony of *P. dumosa*. Flemming—carmalum.
Fig. 6. *P. dumosa*. Osmic 4 per cent.—iodine.

XXVIII.—*Further new African Mammals.*

By Oldfield Thomas.

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Cercopithecus preussi insularis, subsp. n.

Similar in essential characters to the true Kamerun *C. preussi*, Matsch., but tending to be darker throughout. Back much less rich chestnut, the hairs of this part with their bases blackish slaty for more than half their length, then with dull buffy subterminal rings and broad black tips. In true *preussi* they are light slaty for their basal half (or less), their terminal half tawny tipped with black. Tail with