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MYZOSTOMIDA.

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WITH ONE PLATE.

I.—INTRODUCTORY.

The collection of Myzostomes brought back by the "Terra Nova" Expedition is a small one, consisting of one free-living specimen and five cysts obtained within the Antarctic Circle at Stations 294 and 355.

The only Myzostomida previously recorded from Antarctic regions are those collected by the National Antarctic Expedition ("Discovery"), 1901–4, and described by v. Stummer-Traunfels in 1908. The "Terra Nova" collection contains representatives of the two species dealt with in this author's report, and includes no forms new to science; it is, however, not devoid of interest since the cyst-forming specimens belong to the remarkable species *Myzostoma cysticola*, v. Graff, and four of the five cysts were obtained from the peculiar Crinoid *Promachocrinus kerguelenensis*, a form not previously recorded as the host of Myzostomida.

In the structure of their cysts and in their position on the body-disc of the host these parasites differ from all previously known examples; their size, moreover, considerably exceeds that of the specimens described by v. Stummer-Traunfels and other observers of the species.

II.—SYSTEMATIC.

MYZOSTOMA, F. S. Leuckart.

Myzostoma antarcticum, v. Stumm.-Tr.

Myzostoma antarcticum, v. Stummer-Traunfels, Nat. Ant. Exp. ("Discovery"), 1901–4, vol. iv, 1908, Myzostomidæ, p. 2.

This species was formed by v. Stummer-Traunfels for a number of free-living specimens from *Antedon adriani*, Bell, collected by the "Discovery" Expedition. It is represented in the "Terra Nova" collection by a single individual taken at a depth of

547 metres at Station 355, 77° 46′ S., 166° 8′ E. (McMurdo Sound). The host is unfortunately unknown, the worm having been found loose.

The "Terra Nova" specimen is larger than any described by v. Stummer-Traunfels, having a length of 8 mm. The lateral margins are bent downwards so as to make the dorsal surface very convex, but when flattened out the body is seen to have a breadth of nearly 9 mm.

A narrow, translucent marginal area is rather sharply marked off from the very thick body-disc, its border is slightly crenulated and presents distinct concavities at the anterior and posterior extremities.

As in the type specimens the dorsal integument, except in the marginal area, is covered with small, closely set tubercles, too small to be distinguished by the naked eye, but giving the skin a very characteristic "warty" appearance when viewed under a low power of the microscope. v. Stummer-Traunfels describes the ventral surface as smooth; in the specimen before me, however, the ventral integument is sculptured in a similar but less pronounced manner than that of the dorsal surface.

The ten pairs of cirri arise from little notches in the margin, they are bilaterally symmetrical in their arrangement and approximately equidistant from one another, except in the case of the first and last pairs, the members of which are much further apart than the others.

The structure of the parapodia, suckers, and other organs is exactly as in the type specimens.

Myzostoma cysticola, v. Graff.

Myzostoma cysticolum, v. Graff, "Challenger" Rep., vol. x, 1884, p. 66.
" " v. Stummer-Traunfels, *op. cit.*, p. 7.
" " var. *orientale*, McClendon, Bull. Amer. Mus. Nat. Hist., vol. xxii, 1906, p. 120.
" " sub-sp. *cystihymenodes*, McClendon, Proc. U.S. Nat. Mus., vol. xxxii, 1907, p. 65.

I have referred all the cysticolous specimens collected by the "Terra Nova" Expedition to this very interesting species. *M. cysticola* was first described by v. Graff in 1884 from a number of specimens forming small cysts (1–3 mm. in length) on the arms of *Actinometra meridionalis*, var. *carinata*, from Brazil and Grenada.

The species was redescribed in 1906 by McClendon from a single specimen on *Antedon discoidea* obtained by the "Albatross" Expedition off the eastern coast of Japan; on account of the large size of this cyst (5 mm. in length) and of certain slight differences in structure it was referred by the author to a new variety *orientale*.

v. Stummer-Traunfels, in his report on the "Discovery" collection, points out that the differences between McClendon's and v. Graff's specimens are undoubtedly due to individual variation, and includes two large cysts (5 mm. and 6·2 mm. in length) from *Antedon adriani* in this widely distributed species. The cysts and the worms enclosed in them agree in most particulars with the type specimens, apart from size the

chief difference being in the thickness of the cyst-wall, which is considerably less in the Antarctic specimens than in those described by v. Graff. v. Stummer-Traunfels puts forward the view that in the cysticolous Myzostomids the character of the cyst-wall is likely to vary with different hosts, and also that large cysts may be expected to possess thinner walls than small ones; in this connection he calls attention to v. Graff's statement that the smallest of the type cysts was of more solid consistency than the rest.

Whilst v. Stummer-Traunfels' memoir was in preparation McClendon published a second paper containing a short account of a still larger cyst of this species from the Trinity Islands; owing to its large size (7·5 mm. in length) and the uncalcified nature of the cyst-wall he considers it to represent a new sub-species which he names *M. cysticolum cystilymenodes*.

The five cysts obtained by the "Terra Nova" Expedition are, with one exception, larger than any previously recorded; they measure 6, 8, 10, 11 and 12 mm. in length, respectively. Four of these cysts were found attached to the body-discs of *Promachocrinus kerguelenensis*, dredged at a depth of 547 metres at Station 355 in the McMurdo Sound, the fifth being fixed to a fragment of a Crinoid arm* from Station 294 in the Ross Sea at a depth of 289 metres.

Except in size the latter specimen very closely resembles those described by v. Stummer-Traunfels. The cyst (Fig. 5) is ovoid in shape, 10 mm. long, with a maximum width of about 5 mm.; it is attached by its whole length to the arm of the Crinoid, along the ambulacral groove. The cyst-wall is thin and flexible, and is not calcified.

The two openings at the extremities of the cyst are both quite conspicuous. They are, however, very unequal in size; the one directed towards the disc of the host measures a little less than a millimetre in diameter, whilst that at the opposite extremity has a diameter of nearly 3 mm. The latter opening is not quite terminal, being set slightly obliquely to the long axis of the cyst; through it the cloacal extremity of a large Myzostome projects for about 1·5 mm.

As mentioned above, the four cysts from *Promachocrinus kerguelenensis* are peculiar in being attached to the body-discs of their hosts instead of to the arms; three specimens of the Crinoid were found with the parasites, one bearing two cysts.

The cysts have a characteristic and apparently constant position on the actinal surfaces of the discs (Fig. 6), each has its anterior extremity in close proximity to the point of bifurcation of one of the posterior ambulacral grooves, and is attached by its whole length along the branch of the groove which lies closest to the anal tube of the Crinoid. In the case where two cysts occurred on the same host these occupied similar positions on either side of the anal tube.

The cysts from *Promachocrinus kerguelenensis* are approximately oval in shape,

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* The fragment can hardly be determined with certainty, but Prof. F. J. Bell believes it to have belonged to *Antedon adriani*.—S. F. H.

but slightly depressed, the breadth, which measures about one-half of the length, being always a little greater than the height. The cyst-walls are thin and uncalcified. The usual openings are present near the extremities, but, unlike the specimen described from the Crinoid arm, these are approximately equal in size, having a diameter of about 1 millimetre.

The above description shows that both in structure and position on the host the four cysts from Station 355 differ markedly from all previously recorded examples; the worms enclosed in them correspond, however, so closely both with those from the fifth cyst and with those described by v. Graff, v. Stummer-Traunfels, and McClendon, that I have no hesitation in referring them all to the same species.

One of the cysts on the body-disc of *Promachocrinus kerguelenensis* was left intact, all the others were opened, and each was found to contain the usual pair of Myzostomes, consisting of a large individual (so-called "female") occupying the greater part of the cyst-cavity, and a small individual (so-called "male") lying in the narrow space between the former and the cyst-wall.

The large individuals all had the characteristic "tubular" shape, the sides of the body being bent upwards so that the lateral margins come almost to meet in the mid-dorsal line; the margins were never found overlapping as in some of the specimens described by v. Stummer-Traunfels. In their rolled up condition the measurements of these individuals are as follows:—

	Length.	Breadth.	Depth.
a . .	5·5 mm.	2·5 mm.	2·25 mm.
b . .	10 mm.	5 mm.	4·5 mm.
c . .	11·25 mm.	5·5 mm.	5 mm.
d . .	9 mm.	3·5 mm.	4·25 mm.

Specimens *a*, *b* and *c* are from the cysts on the body-disc of *Promachocrinus kerguelenensis*. It will be noticed that these are slightly depressed in shape, in conformity with the shape of the cysts. The orientation of these large individuals within the cysts was characteristic and evidently constant; each worm, as usual, lay with its ventral surface downwards, but its vertical plane was not at right angles to the surface of the disc, being inclined slightly to one side, so that the mid-dorsal line, represented by the groove between the body margins, came to be directed towards the anal tube of the Crinoid host.

I have not much to add to previous accounts of the structure of the large individuals (*cf.* Figs. 1–3). The parapodia are quite small, almost vestigial; suckers and cirri are absent. The ventral surface of the body is smooth and not sculptured; in some specimens it is divided up into a number of areas by faint grooves (Fig. 1). The mouth is situated at the bottom of a deep anterior concavity, the pharynx is protruded through the cyst-opening in the majority of cases, and appears as a stout cylindrical organ, without papillæ on the oral margin.

The size of the small individuals seems to vary with that of the large individuals, those found in the larger cysts from the "Terra Nova" collection being considerably larger than the specimens described by previous observers. They are approximately circular in shape, but always a little longer than broad, as shown by the following measurements :—

	Length.	Breadth.
a . . .	1·35 mm.	1·1 mm.
b . . .	1·95 mm.	1·8 mm.
c . . .	2·2 mm.	2 mm.
d . . .	2·1 mm.	1·8 mm.

In structure these specimens agree perfectly with those described by v. Stummer-Traunfels, and the largest show no marked advance over the smallest investigated by previous observers (the "male" individual described by v. Graff had a length of ·8 mm. only).

The different individuals show considerable variation in the mode of branching of the intestinal cæca ; the latter may even differ on the two sides of the body, as shown in Fig. 4.

The exact positions of the parapodia also vary somewhat ; in all the specimens, however, the third parapodium of each side is situated nearer the centre of the body than the rest. The other organs are exactly as described by v. Stummer-Traunfels.

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3. McClendon, J. F.—"The Myzostomes of the 'Albatross' Expedition to Japan." Bull. Amer. Mus. Nat. Hist., vol. xxii, 1906.
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PLATE I.

Myzostoma cysticola, v. Graff.

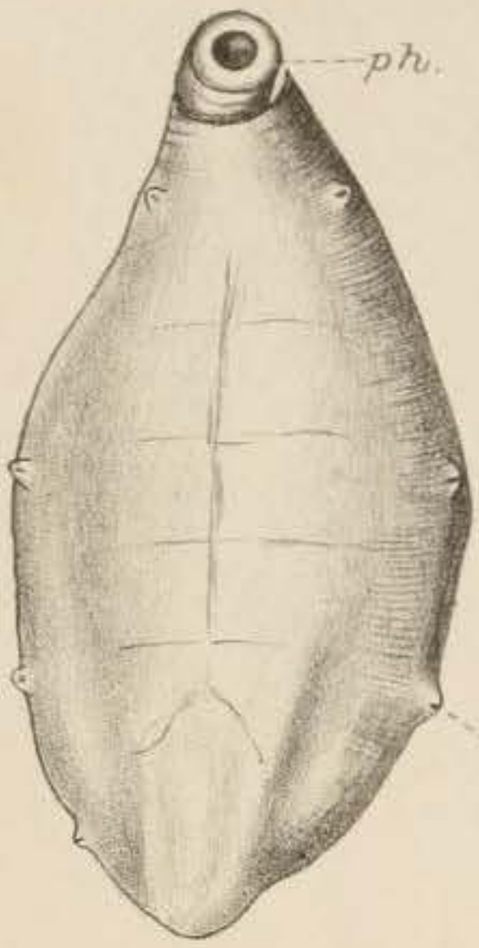
Fig. 1. Large individual ("female") from cyst on body-disc of *Promachocrinus kerguelenensis*, ventral view, × 7.
Fig. 2. Same individual, dorsal view, × 7.
Fig. 3. Same individual, lateral view, × 7.
Fig. 4. Small individual ("male") from the same cyst as the specimen shown in Figs. 1–3 ; ventral view, as seen when cleared in cedar-wood oil, × 38.
Fig. 5. Cyst on the arm of a Crinoid, × 7.
Fig. 6. Part of the body-disc of *Promachocrinus kerguelenensis* with attached cyst, × $4\frac{1}{2}$.

LETTERING.

an. t., Anal tube of Crinoid.
cl., Cloaca.
int., Branch of intestine.
M., Myzostome protruding through cyst-opening.
m., Mouth of Crinoid.
M.c., Cyst of Myzostome.
p., Parapodium.
ph., Pharynx.
st., Stomach.
te, Testis.
♂, Male genital opening.

Brit. Antarctic (Terra Nova) Exped. 1910.

Brit. Mus. (Nat. Hist.) Zoology, Vol. II. Myzostomida. Pl. I.



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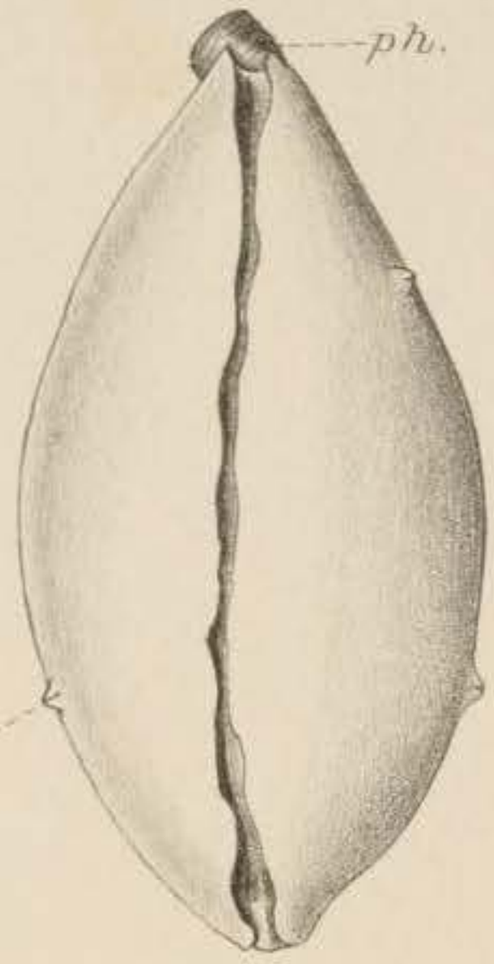

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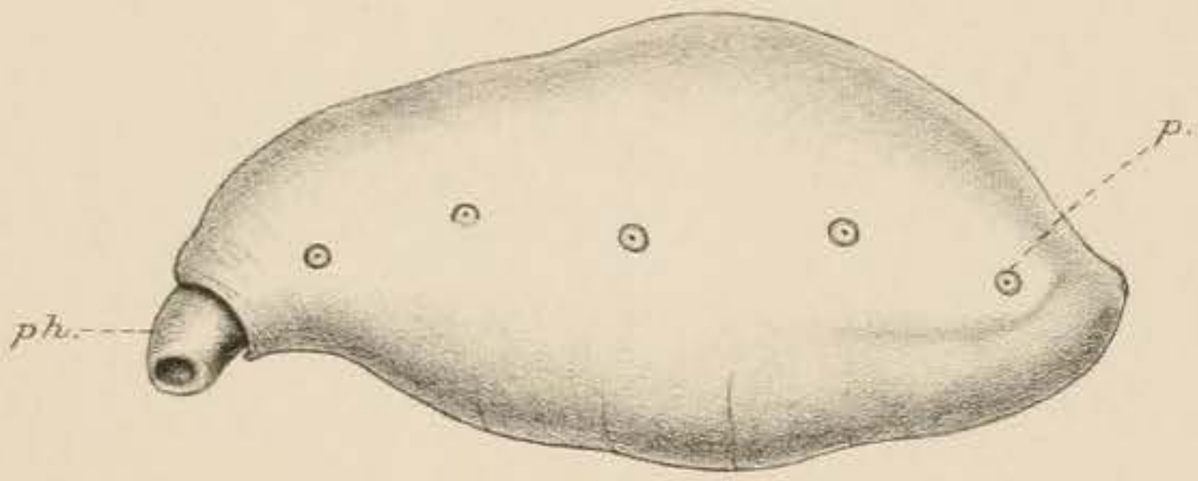

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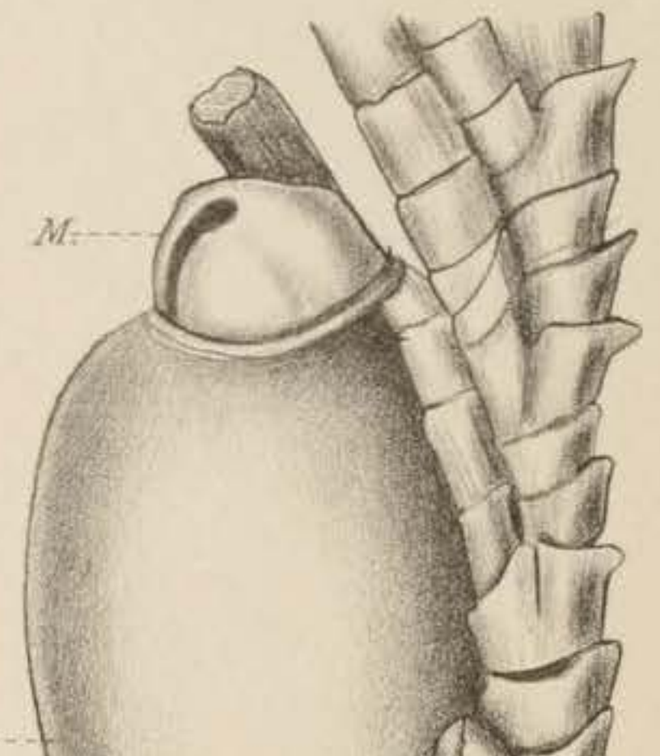

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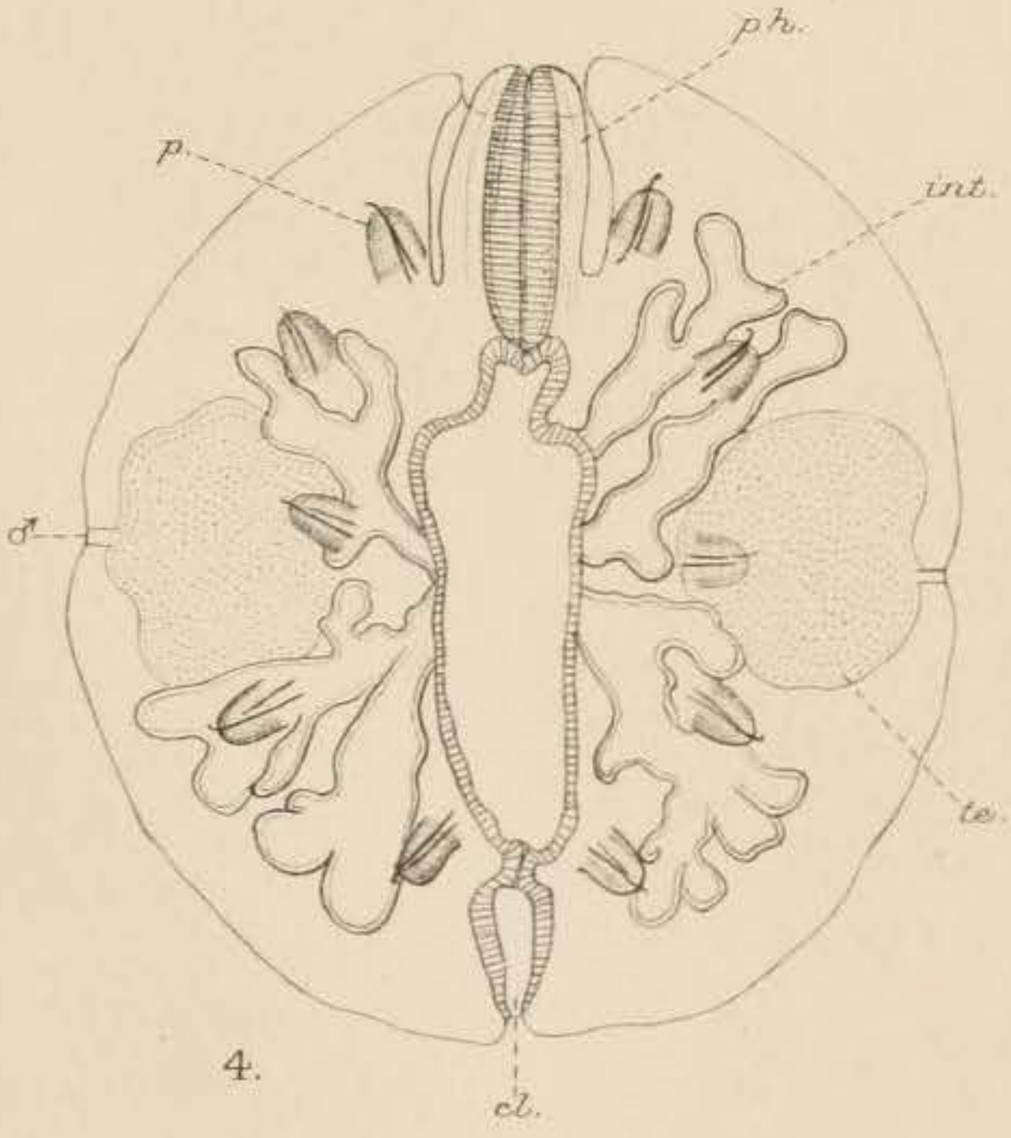

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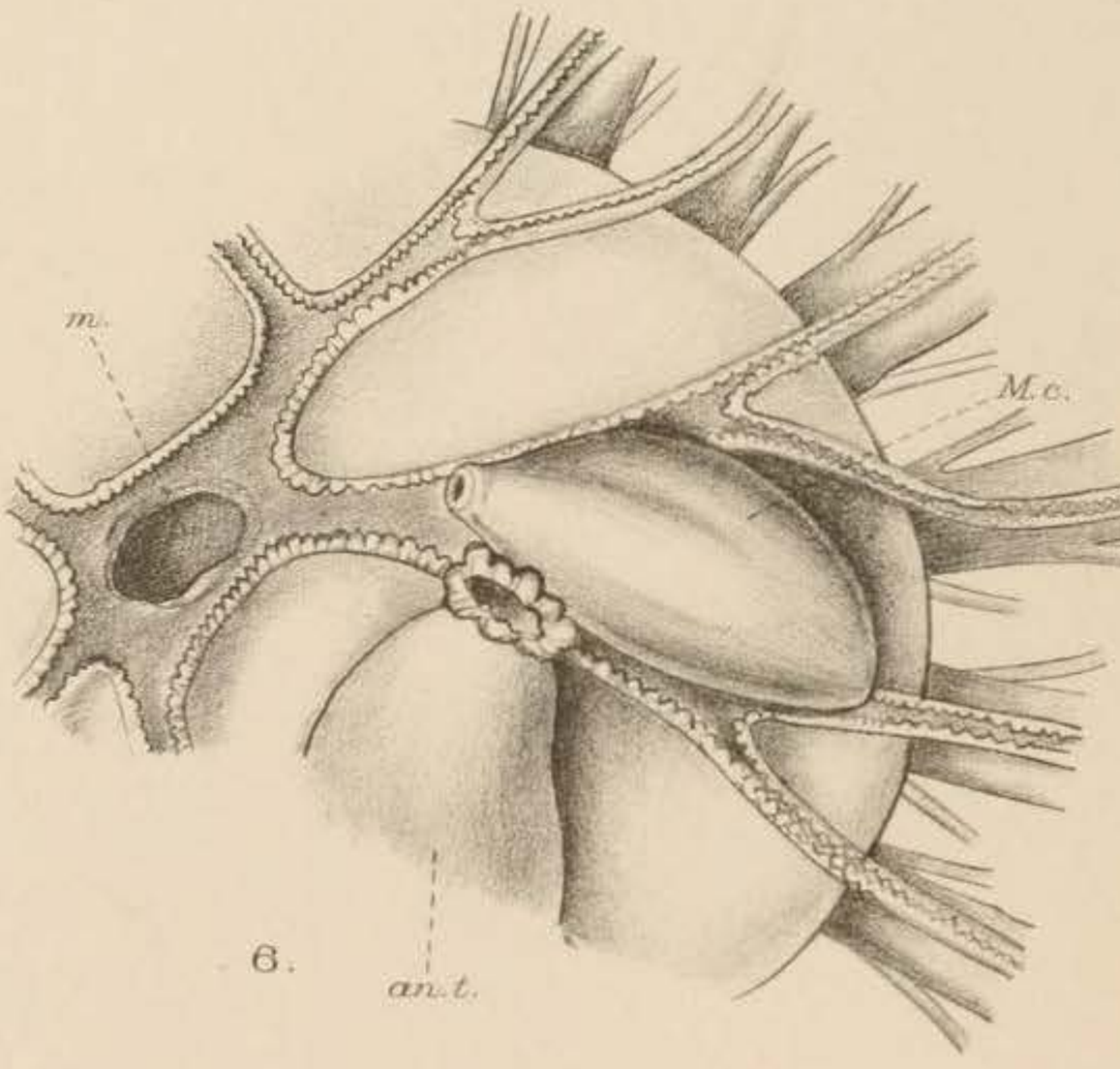

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