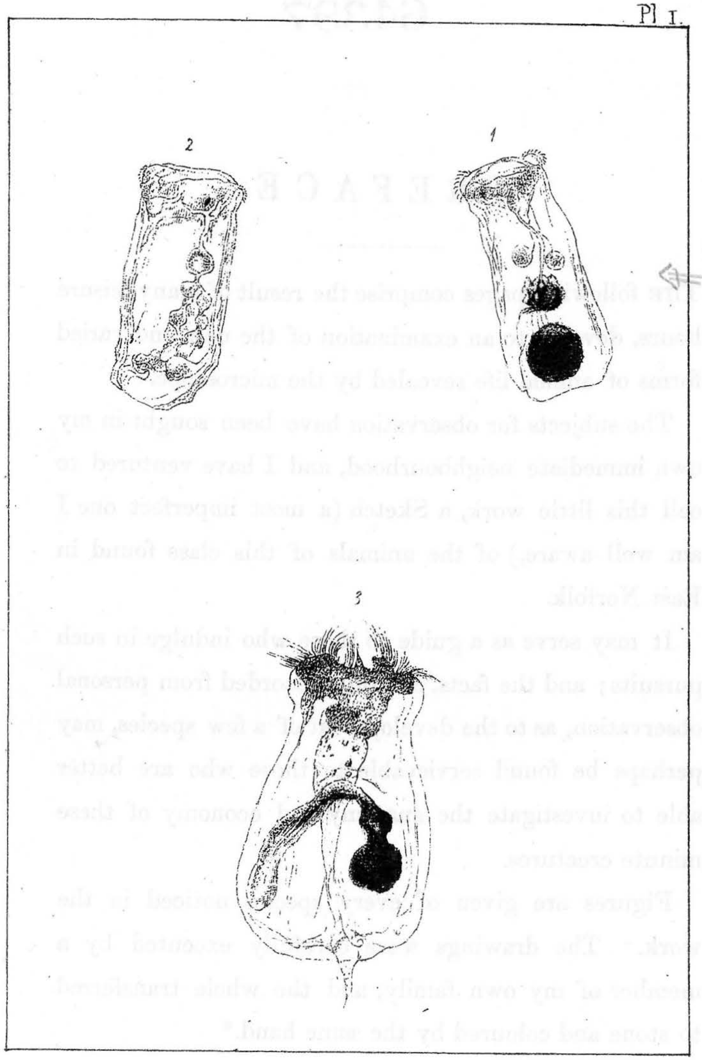

Asplanchna Brightwellii Gosse, 1850

SKETCH

OF A

FAUNA INFUSORIA,

FOR

EAST NORFOLK.

BY

T. BRIGHTWELL, F.L.S.

"Eminet in minimis maximus ipse Deus."

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PREFACE.

THE following pages comprise the result of many leisure hours, devoted to an examination of the new and varied forms of animal life revealed by the microscope.

The subjects for observation have been sought in my own immediate neighbourhood, and I have ventured to call this little work, a Sketch (a most imperfect one I am well aware,) of the animals of this class found in East Norfolk.

It may serve as a guide to those who indulge in such pursuits; and the facts, carefully recorded from personal observation, as to the development of a few species, may perhaps be found serviceable to those who are better able to investigate the anatomy and economy of these minute creatures.

Figures are given of every species noticed in the work. The drawings were carefully executed by a member of my own family, and the whole transferred to stone and coloured by the same hand.*

* 100 copies only have been printed for private distribution.

Most of the published figures of these animals are taken from specimens fed with indigo or carmine, but I have preferred to exhibit them as they appear in their natural state, magnified by one of Ross's microscopes, a half-inch achromatic object glass being that generally used. All the figures were drawn by day-light, the only light to be relied on for a clear definition of form, and for colour.

The only works consulted have been the article "Infusoires," in the "Encyclopédie Méthodique," chiefly compiled from Müller, "Baker's employment for the Microscope," "Pritchard's History of Infusoria, second edition," and Felix Dujardin's "Infusoires, comprenant la physiologie et la classification de ces animaux."

I have not been fortunate enough to see Ehrenberg's great work on the Infusoria, but Pritchard's work (which is principally compiled from it) gives Ehrenberg's descriptions of most of the known species.

Norwich, March, 1848.

EXPLANATION OF THE PLATES.

SKETCH

OF A

FAUNA INFUSORIA,

FOR EAST NORFOLK.

NOTOMMATA.

PLATE I. *fig.* 1, 2. *Query, an undescribed species.*
fig. 3. *N. clavulata*, EHRENBERG.

Figures 1, 2. This Notommata is large enough to be detected by the naked eye. It is beautifully transparent, and the general outline of its organization may be seen under a low power. The cilia around the mouth are small. It has a minute red eye, difficult to detect in the adult, but more clearly seen in the young. The stomach is a bag without any lower opening, and the food, when digested, is returned through the gullet. It has no anal opening, and no caudal appendage whatever. It is furnished with a double jaw of considerable power, and an ovisac in which the young may be clearly detected, and from which they are expelled, through the side of the animal. Some of the young appear to differ in form from the others, and there appear to be two kinds of ova; one, and that by far the greater number, transparent, and hatched in the

body of the parent; and the other more opaque, perhaps remaining unhatched, or deposited till vivified under favourable circumstances, in some ensuing season. Should this, on further investigation, turn out to be the case, we shall have, among the Rotifera, the same mode of preserving the ova during the winter, as is found in some of the Entomostraca, the Daphniæ, for instance, whose Ephippial ova are a beautiful provision for this purpose.* The ova of the *Alcyonella Stagnorum* seem to have the same character.

Mr. John Dalrymple, whom I have furnished with specimens, has detected among them, what he suspects to be a sexual difference. The majority of the animals are females, but he has detected both in the fœtal and developed state, a few of a different construction, which he takes to be the males. These are smaller than the females, and have a pyriform sac below, from which there is an opening, and which is filled with spermatazoa; and what is most singular, they have neither jaws nor gullet, nor stomach, and it would seem they are designed, as is the case with the males of some insects, to continue the race, and then to perish. Should further investigation enable Mr. D. to complete his observations on this interesting subject, he intends, I believe, to call the attention of naturalists to this curious discovery, the first

* See Mag. Nat. History, Vol. II, pp. 410, 411.

hitherto of any sexual distinction observable among this race of animals.

This species appears to be altogether new and undescribed, and from the entire absence of any caudal appendage or foot, and the want of an anal orifice, it cannot indeed properly be included in the Genus Notommata of Ehrenberg, since he gives these as generic characters of the Notommata.

Found, in July and August, in a pond, in Mr. Blake's brick-ground, St. Stephen's, Norwich. It appears very abundantly in some seasons; and at others it disappears altogether. In the figure No. 1, *may be distinguished the œsophagus, leading to the stomach, colored yellow, and above the stomach two small bodies, (either salivary or hepatic glands,) and under it the more rare opaque ovisac before noticed. Figure No.* 2 *is a young specimen, just emerged, in which the red eye, and germs of the other organs are seen. In the frontispiece will be found a figure of the supposed male, taken from a drawing by Mr. Dalrymple.*

No. 3. *Notommata clavulata* of Ehrenberg, is figured from specimens sent me by Mr. Dalrymple, taken at Hillingdon, near Uxbridge. In outward form, it nearly resembles Nos. 1 and 2, but is clearly distinct from it, being furnished with a forcipated caudal appendage. The cilia round the mouth are larger, the pouch, stomach, and intestine, are clearly seen, running down the centre of the animal, to the usual orifice, and the ovary and ovisac lying transverse.

PTERODINA—(Brachionus Müller.)

Plate IV. *fig.* 1. *P. Patina.*
fig. 2. *P. elliptica.*

The orbicular shield of these beautiful animals, is as clear as crystal, and the internal organization may be clearly traced. They are found in ditches and pools of soft water, among duck weed, and aquatic plants. The P. Patina is sometimes found very abundantly on the under side of the leaves of the white water lily.

BRACHIONUS.

Plate III. *fig.* 2. *B. Bakeri.*
fig. 4. *B. urceolaris.*
Plate IV. *fig.* 4. *B. patulus.*
fig. 5. *B.* —— ?

B. Bakeri, is one of the larger Rotifera, chiefly distinguished by the elongation of the two middle spines, (of which there are four,) in front, and of the two spines at the hind part of the shield. It has, like most of the Brachioni, a long tail, which Baker very truly says, "it wags backwards and forwards as a dog does his."

It is found in ditches and small ponds, and is named after Henry Baker, Esq., F.R.S., author of the "Employment for the Microscope," &c., and is described by

him at p. 301 of that work, and figured Plate XII., 11, 12, 13. This estimable man, and his friend and correspondent, Mr. Arderon, of Norwich, (to whom Baker was indebted for much of the material of his "Account of various Animalcules,") laboured in the field of natural science, about a century ago. There is, in the midst of a certain homeliness of style and illustration, so much simplicity and love of nature, and so much freshness of original and correct observation in his works, as give a great charm and value to them. Baker's observations, and especially Arderon's, are a storehouse of facts on these subjects, to which modern compilers are more indebted than they choose to acknowledge.*

The following interesting observations as to the development of this species, have been communicated to me by a friend, an accurate and diligent observer of nature. "About two o'clock P.M., *B. Bakeri* was observed with one egg placed externally between the two posterior spines of the shell, and another small egg in the left side of the animal, which increased much in size in the course

* Baker's papers and correspondence now form part of the vast collection of Dawson Turner, Esq., of Yarmouth, through whose kindness, I have been enabled to illustrate my copy of Baker's work, with a characteristic portrait of him. Two valuable letters from Baker to Dr. Doddridge will be found in the 5th Vol. of "the Diary and Correspondence" of the latter, edited by J. D. Humphreys, Esq., and at pp. 24, 25, of the same Vol., Mr. H. has added some interesting particulars of Baker and his writings. He married a daughter of the celebrated Daniel Defoe, and was the greater part of his life chiefly engaged in teaching the deaf and dumb.

of the day. At nine in the evening, a motion was perceived in the exterior egg, like that of the muscular œsophagus of the parent; and about this time the internal egg was protruded, and placed by the side of the other, being larger than it. At eleven, the young Brachionus burst with a bound, from the egg in which the motion was perceived, and affixed itself by its tail, to the lunette. At first, it had the appearance of an oblong ball; by degrees, the anterior part spread, and the wheel processes were developed. Soon after, the posterior shell processes were visible, in a semilunar shape, with the points nearly touching each other, which gradually expanded. The shell of the egg remained attached to the parent B. in the same position, quite transparent, with a longitudinal split through the whole length."

B. urceolaris is about the size of *B. Bakeri*, and is found in the same localities. It has six short spines, in front of the shield, which is rounded behind.

B. patulus is about half the size of the two preceding species. This, and other Rotifera, are often found adhering, in great numbers, to the Daphnia Pulex, or Water Flea. The Daphnia seems merely used as a *point d'appui*, by means of which, these parasites (keeping their wheels in motion,) are borne into various localities in pursuit of their prey. Baker has figured a Daphnia with a Brachionus upon it. Plate XII., fig. 14.

ANURÆA.—(Ehrenberg.)

Plate III. *fig.* 1. *A. biremis.*

This species is remarkable for having a moveable spine on each side of the posterior part of the shield.

NOTEUS.

Plate III. *fig.* 3. *N. quadricornis.*

This is the largest of the shielded Rotifera, and is visible to the naked eye; the shield is round, granulated, and transparent; with four straight projections in front, and two spines behind. We have found it in ponds and ditches, among sedges, but it is not very common.

ACTINURUS.

Plate V. *fig.* 2, 3. *A. Neptunius.*

This animal is much allied to the well-known and oft described *Rotifer vulgaris*, or common wheel animalcule. It is distinguished from it by its three long toes, (the *R. vulgaris* having only two,) and by its more elongated body, the sections of which draw into each other like a pocket telescope. It is met with among duck-weed.

Found plentifully in a small pond, in a field at the corner of Hangman's Lane, near Norwich.

The revivifying powers of *R. vulgaris* are well known, and we have oft had occasion to test them. Mr. Priest, of Norwich, watch-maker, had some sand from the roof of a church in Suffolk, which he kept many months in a box, and could at any time, by putting a small quantity into water, revive the Rotifera dried up among it. We have had no opportunity of trying this process with the *A. Neptunius*, but have no doubt it has the same power.

STEPHANOPS.

PLATE V. *fig.* 1. *S. lamellaris.*

This genus is distinguished by a very transparent hood or diadem, in front. The *S. lamellaris* has three spines behind, and a forked tail. It is a transparent animal, of rapid and graceful motion.

Found among duck-weed and confervæ.

EUCHLANIS.

PLATE IV. *fig.* 3. *E. triquetra?*

A large transparent species, found in boggy pools.

PLEUROTROCHA.

PLATE XI. *fig.* 6. *P. constricta?*

This minute Rotifer has the body elongated, and

separated from the head by a stricture; it is very active.

Found in a pond at Buxton, Norfolk.

FLOSCULARIA.

PLATE VI. *fig.* 1, 2, 3. *F. ornata.*
4. *F. proboscidea.*

These are beautiful transparent animals, with a gelatinous case, so clear, as often to escape observation. They are found adhering to Ceratophylla, and other aquatic plants.

MELICERTA.

PLATE II. *fig.* 3. *M. ringens.*

These case animalcules are found upon the stalks of the larger duck-weed, and other water plants. The case of *M. ringens* is formed of lenticular particles of a reddish brown excrementitious matter, thrown up by the animal from its discharging orifice (which is at the upper part) and glued together by it, in lateral rows. This curious process may be detected on a careful and patient observation, and the animal may be made to build a colored case by mixing carmine or indigo with the water; or a case, composed of alternate rows of blue and red, if the colours are carefully changed.

LIMNIAS.

PLATE II. *fig.* 1. *L. Ceratophylli.*
2. *L.* ——— ?

These are closely allied to the last. The *L. Ceratophylli* is found upon the horn-wort, and other water plants. The case is smooth, and of a blackish colour, and differs much in length.

Figure 2 appears to be a distinct species, which I do not find described. The case is ribbed and semi-transparent, and is composed of a series of lateral rings.

Found in a water-ditch, connected with the river, near Whitlingham, Norwich, upon the stalks of the larger duck-weed.

EUPLOTES, (EHREN.)—TRICHODA, (MÜLLER.)

PLATE XIX. *fig.* 3. *E. Charon?*

This genus, of which there are several species, not very easy to determine, is characterized by its oval depressed form and striated lorica, having on one side a few straggling, thick, bristle-like cilia, moveable, but not vibratile, with which they are able to walk slowly upon solid bodies, like insects; and having on the other side a semicircular range of vibratile cilia. *E. Charon* is found in vegetable infusions, and standing water, and various species are found both in salt water and fresh.

KERONA.

PLATE XIX. *fig.* 6. *K. haustellum? Müller.*

Body depressed, elliptical, kidney shaped; with a series of cilia round the front.

Found among duck-weed.

VAGINICOLA.

PLATE XIX. *fig.* 1. *V. chrystallina.*
8. *V. tincta.*
9. *V. Ampulla.*
10. *V.* ——— ?

These animals are lodged in a transparent sheath, into which they withdraw themselves on the least alarm. Two individuals are often seen in the same sheath, the result of a spontaneous longitudinal division, by which they multiply themselves. The species figured will be better understood by the figures than by any description. The double green one (fig. 10) does not appear to be described. They are mostly found on duck-weed, and other small aquatic plants. The *V. chrystallina* I have found in the marshes, at Reedham, Norfolk; but the *V. Ampulla* is found in sea water. I have seen only one small specimen of *V. Ampulla*, which I found at Lowestoft, among sea-weeds. Müller, who has given good figures of this species, seems to have found it abundant


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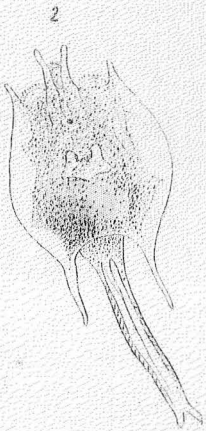
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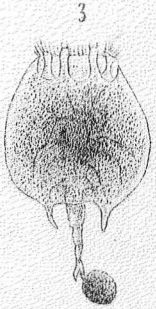
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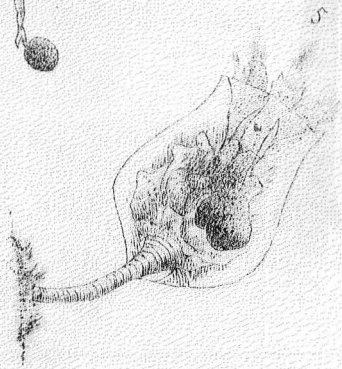
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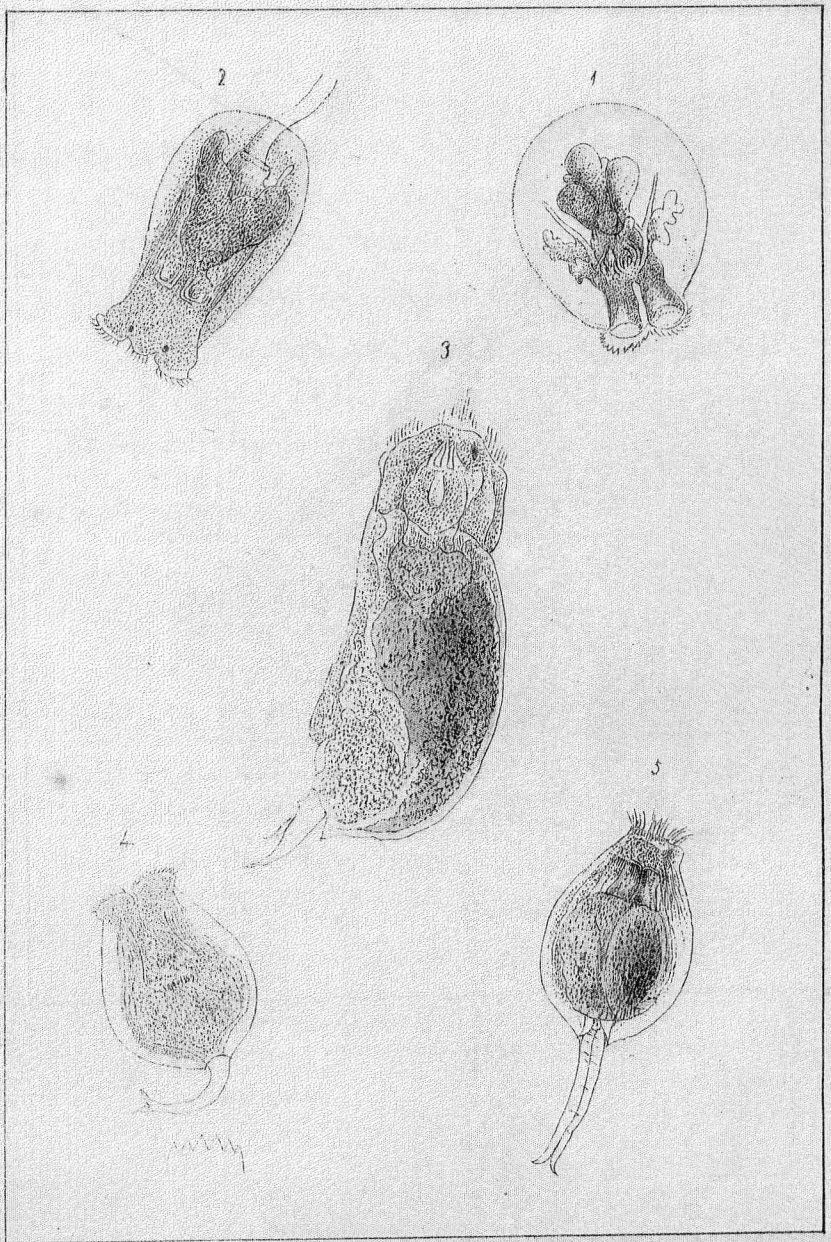
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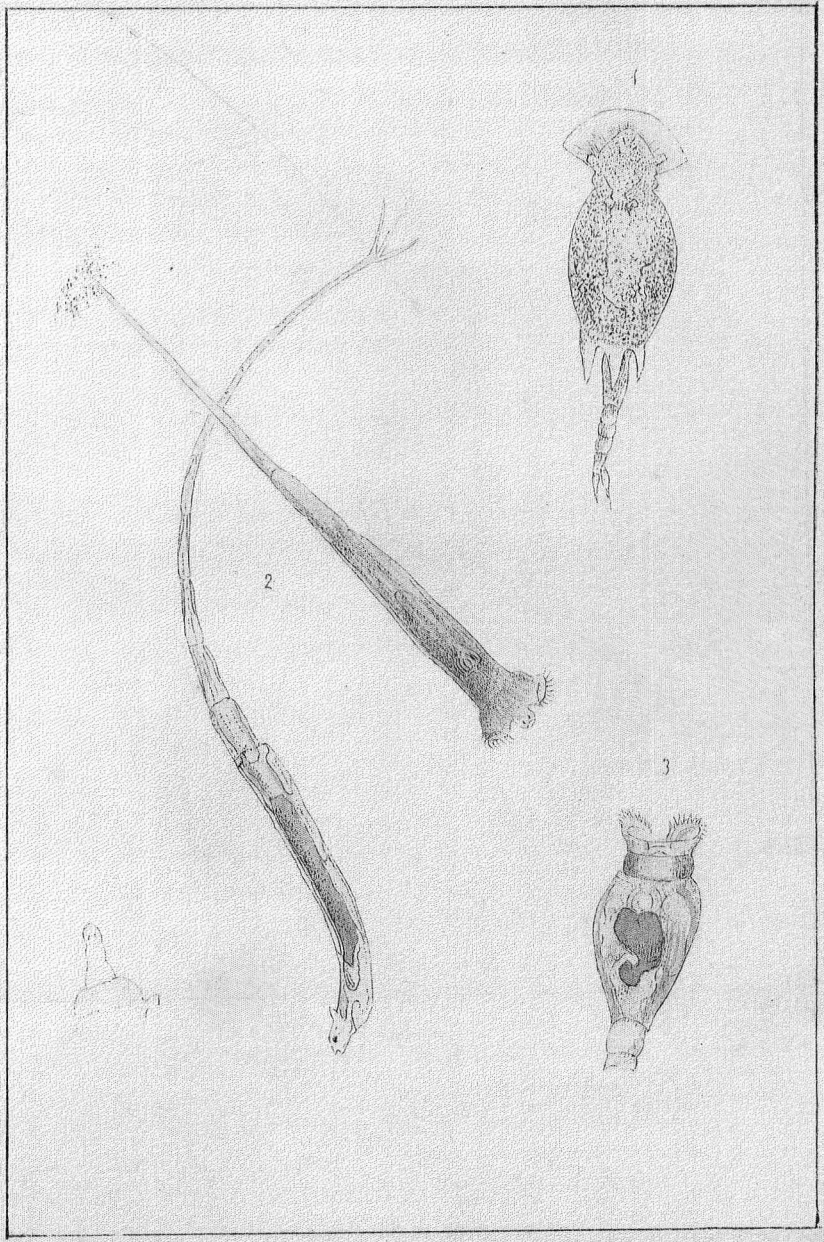
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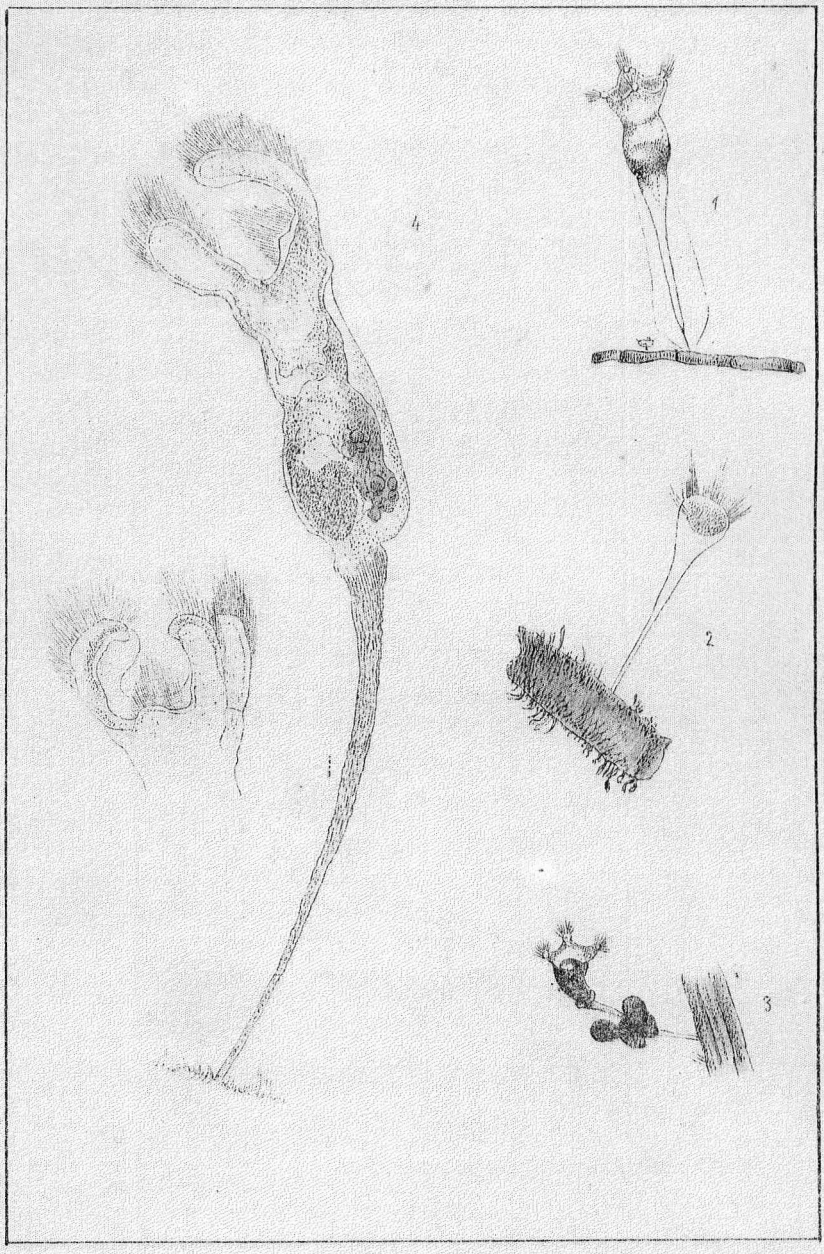
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