apical groove. Head small, depressed, with the snout of moderate length, subtruncated in front; rostral shield rather broader than high; loreal not quite twice as long as high; præorbital reaching to, or nearly reaching to, the vertical; two post-orbitals; nine upper labials, the fourth, fifth, and sixth of which enter the orbit; temporals 1+2+2; occipitals rounded, each with a larger rounded scale behind; six lower labials are in contact with the chin-shields. Eye rather large, with round pupil. Body very slender, compressed; tail very long, angular. Ventral shields 165, angularly bent on each side, the central portion being not much broader than long; anal bifid; subcaudals 153. The posterior maxillary tooth is the longest, not grooved, and is separated from the others by a short interspace. Above uniform metallic brownish-green, below greenish; scales on the back narrowly edged with black; one of the specimens has blackish dots on the crown of the head. No band either on the side of the head or of the body.

This species would enter the subgenus *Uromacer* of Duméril and Bibron.

The British Museum possesses two examples of this species, one from Demerara; the origin of the other is not known. The latter is 32 inches long, the head measuring 7 lines, and the tail 13½ inches.

XXXIII.—*On an undescribed Indigenous Form of* Amœba.

By G. C. Wallich, M.D., F.L.S., &c. &c.

[Plate VIII.]

The occurrence of an undescribed variety of *Amœba* in the immediate vicinity of the metropolis is of interest both on its own account and from the indication it affords that the study of our indigenous Rhizopodal fauna is still unexhausted. The variety in question was recently obtained, in considerable abundance, from the ponds on Hampstead Heath; and inasmuch as every specimen examined by me has presented the very singular characters to which I am now about to draw attention, there is every reason to believe that these are normal, although perhaps not permanent in their nature.

According to the descriptions of the commoner forms—as, for example, *A. princeps*, *A. diffluens*, or *A. radiosa**—it would appear that the sarcode substance is uniformly differentiated into "endosarc" and "ectosarc." In other words, setting aside the elementary organs which may be said to be shadowed forth by the contractile vesicle, the nucleus, and the protoplasmic granular

* It will, I think, eventually be found that all these are mere transitory phases of one and the same species.

bodies, neither the outer layer of sarcode, nor the more viscid mass within, is endowed with a more advanced degree of development at one point than at another. And, in addition to this, the creature possesses the power of moving with equal facility in every direction, by means of pseudopodia projected indiscriminately from any portion of its surface.

In the variety under notice (see Plate VIII.) this is not the case, inasmuch as one portion of the ectosarc exhibits a structure differing permanently from the remainder—being densely studded with minute papillæ which, in the quiescent state of the creature, are of nearly uniform aspect and size, and cause the surface upon which they occur to resemble the villous structure of mucous membrane in outward appearance. When the animal moves, these papillæ or villi vary in length, and now and then several coalesce so as to form processes more nearly approaching the ordinary pseudopodial character, although still of minute proportions. The villous patch, which occupies probably from $\frac{1}{20}$th to $\frac{1}{10}$th of the entire superficies, appears frequently to be employed as a prehensile organ, the creature being enabled through its agency to secure for itself a continuous *point d'appui* from which the rest of the body is pushed or flows onwards, almost invariably in an opposite direction to that in which the villous patch is itself situated. The true pseudopodia would seem never to be projected from this area; but should a retrograde movement be about to take place, they are either thrown out from the adjacent portion of the ectosarc, or the main mass of the organism flows altogether in a backward course, the villous patch remaining fixed until it once more assumes its position at the posterior part of the advancing mass.

So powerful is the prehensile power referred to, that some of the papillæ at times become stretched beyond their endurance and are torn asunder; minute shreds being left adherent to the foreign bodies in the neighbourhood. Should the animal be subjected to pressure between the slide and glass cover, the papillæ may occasionally be seen to adhere to the polished surfaces, some relaxing their hold and taking up a position in advance, whilst those described as being stretched till they detach or break asunder are, in turn, moved onwards until they once more secure an attachment for themselves.

On the other hand, the pseudopodial processes and the rest of the ectosarc generally seem to exercise no prehensile power. In the one case the marginal layer is broken up into a delicate villous coat, the hyaline transparency of which is destroyed and replaced by a pale cream-coloured opacity; in the other it is perfectly hyaline, clearly defined, and unbroken. I have only in a very few instances been enabled to trace an influx of granu-

lar particles of endosarc within such of the coalesced villi as, from their size, rendered observation practicable.

As a general rule, the contractile vesicle and nucleus maintain a position close to the villous patch, even whilst the animal is moving—the former organ being in close proximity to it, and sometimes appearing to discharge itself, by the usual systolic action, at a spot within the villous surface. But now and then both nucleus and contractile vesicle move slowly round with the mass of circulating particles. The villous area, however, retains its position in relation to the rest of the body.

In some specimens the contractile vesicle presents an appearance of the most delicate reticulation, resembling that described as occurring on the external surface of *Actinophrys*, and depending probably on a similar cause, namely, the occurrence of a number of minute vacuoles. The contractile vesicles occasionally subdivide into several smaller cavities, as constantly happens in other forms; and these either coalesce prior to collapse, or they collapse separately. But no sinuses of the kind described by Carter in *Paramecium aurelia* and other Infusoria are discernible. Vacuoles are frequent, and in some cases of sufficient size to contain large diatoms.

The nucleus consists of a pale grey-coloured spherical mass of granules, towards the centre of which may occasionally be detected a minute clear nucleolus. It is contained within a hyaline and somewhat elongated vesicular cavity, but never occupies the entire area of the latter.

Dilute alkaline and acid solutions cause the body at once to assume a more or less spherical shape, and the granular contents to close up into a central mass, leaving a broad hyaline border around the entire surface, as described by Auerbach in *Amœba bilimbosa*. But these reagents fail to render apparent anything like the double outline, indicative of a definite membranous envelope, alluded to by that author. It is worthy of note, however, that, under imperfect adjustment of focus or want of due care in illumination, the *semblance* of a double outline can be evoked.

Some of the specimens of the Hampstead *Amœba* are of extraordinary dimensions, the largest attaining a diameter of no less than $\frac{1}{50}$th of an inch. The villi, in their quiescent state, seem to be about $\frac{1}{15000}$th of an inch in average length.

In a solitary example, the villous patch constituted a nearly circular brush-like tuft at the extremity of a cylindrical pedicle of hyaline sarcode; and at its centre was a minute vacuole-like space. I kept my eye on this specimen for nearly a quarter of an hour without perceiving this structure alter in anywise,—the prehensile power of the villi seeming to be either suspended

or destroyed, and both brush-like tuft and pedicle being dragged behind the *Amœba* during the entire period. Unfortunately the drying-up of the water on the slide put a stop to my observation at this point.

With regard to the specific value of the characters of this form, I think it unadvisable at present to express a decided opinion. Several circumstances render it probable that it may be a transient phase in the life-history of the common *Amœba*. Amongst the principal of these I may mention having detected traces of a like villous structure in specimens obtained from other localities. But, whether the Hampstead form eventually proves to be a distinct permanent type or otherwise, the characters referred to are of high interest as evincing a nearer approach, than any heretofore noted amongst the Rhizopods, to the structure of the ciliary legs of certain Infusoria, as, for example, of *Plæsconia* or *Kerona**. They also tend to confirm the view put forward by MM. Claparède and Lachmann with reference to the "reptant" nature of the motion of *Amœba*, and the consequent suggestion of Dr. Carpenter regarding the probable differentiation of the ectosarc into a ventral and dorsal portion. According to present experience, "reptation" takes place in forms endowed with this more highly developed state of a portion of the ectosarc, whilst the motion is of a simple "rolling" or flowing kind in those forms in which the ectosarc is uniformly developed at all points.

The Hampstead form corresponds in every important particular with one found by me in Lower Bengal in 1856, in which the villous portion of the ectosarc constitutes a means of permanent attachment to foreign bodies such as Confervæ or the like; and the animal appears to be normally sessile in its habits†.

In conclusion, I may mention that a week has passed since the supply of these *Amœbæ* was obtained at Hampstead, and that they retain the characters above described in an unimpaired degree to the hour at which I write.

EXPLANATION OF PLATE VIII.

[Figures 1 to 5 magnified about 400 diameters.]

Fig. 1. *Amœba* in quiescent or nearly quiescent state: *a*, villous patch; *n*, nucleus; *c*, contractile vesicle; *v*, vacuoles‡.

* See Carter's observations on these forms in the 'Annals and Magazine of Natural History, 3rd series, vol. iii. p. 241 *et seq.*

† This variety is figured in Part I. of my 'North Atlantic Sea-Bed,' pl. 4. figs. 13 & 14.

‡ Each letter applies to the same portions of the structure in the several figures. The arrows indicate the direction in which the animal is supposed to be advancing.

Fig. 2. Showing the appearance of the *Amœba* when moving slowly, the villi being employed as organs of prehension.

Fig. 3. The same, when advancing energetically, the villous patch being aggregated into a subspherical tuft, and the contractile vesicle and nucleus now sharing in the general protoplasmic circulation.

Fig. 4. A specimen with two large *Pinnulariæ* in its interior, the upper of the two frustules being enclosed within a large vacuole.

Fig. 5. A specimen in which the villous patch has assumed a brush-like shape, and is supported on an elongated pedicle of sarcode; 5 *x*, an enlarged view of this tuft and its supporting pedicle.

Fig. 6. Enlarged view of granular nucleus, nucleolus, and the nuclear vesicle or cavity.

Fig. 7. Contractile vesicle, showing appearance of reticulation.

BIBLIOGRAPHICAL NOTICES.

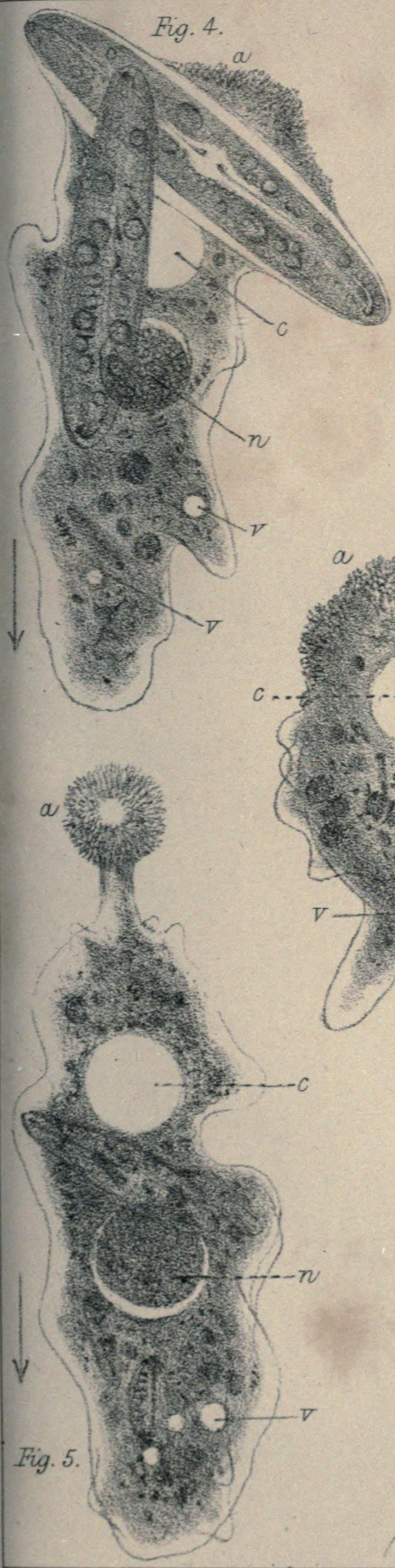
The Land and Freshwater Mollusks indigenous to, or naturalized in, the British Isles. By Lovell Reeve, F.L.S. Reeve & Co., 1863.

Only a few months have elapsed since we had occasion to notice the publication of the first volume of a new work by Mr. Jeffreys, on British Conchology, which treats of the Inland Mollusca; and already another handbook on the same subject lies upon our table.

The valuable illustrated works on 'Conchology' by Mr. Reeve are well known, and more especially his splendid 'Conchologia Iconica;' but, until we read the announcement of the intended publication of the work which we are about to review, we were not aware that the author had paid any special attention to the Mollusca of our Islands. We cannot therefore expect to find in this volume the same mass of interesting detail which long years of patient and special study have enabled Mr. Jeffreys to condense in the pages of 'British Conchology.' On the other hand, however, 'The Land and Freshwater Mollusks' is more fully illustrated, and the woodcuts of all the species offer an attraction which Mr. Jeffreys's volume does not possess.

The animals are engraved by Mr. O. Jewett, some from original drawings, while others are reproductions of previously published figures. The original drawings from the life, which may be recognized by Mr. Jewett's autograph, are admirable. We were not previously acquainted with this artist's name as a natural-history draughtsman; but such life-like and characteristic figures as those of *Limax Sowerbyi, flavus,* and *cinereus, Helix aspersa, Planorbis corneus, Paludina contecta, Dreissena polymorpha, Anodonta cygnea,* and *Unio tumidus* raise him to a high position among delineators of Mollusca. Unfortunately the same praise cannot be bestowed on Mr. Sowerby's figures of the shells; for while the woodcuts of the larger species are generally good, no trouble appears to have been bestowed upon the smaller and closely allied species; and thus in those very instances where accurate illustrations were most desirable and would have been of most value, we meet with engravings which are not only worthless, but calculated to mislead.

Fig. 4.



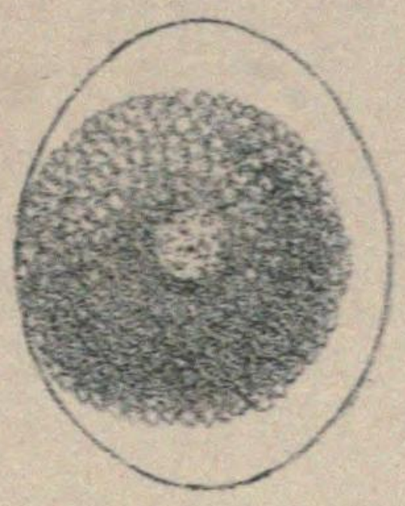


Fig. 6.

Fig. 3.

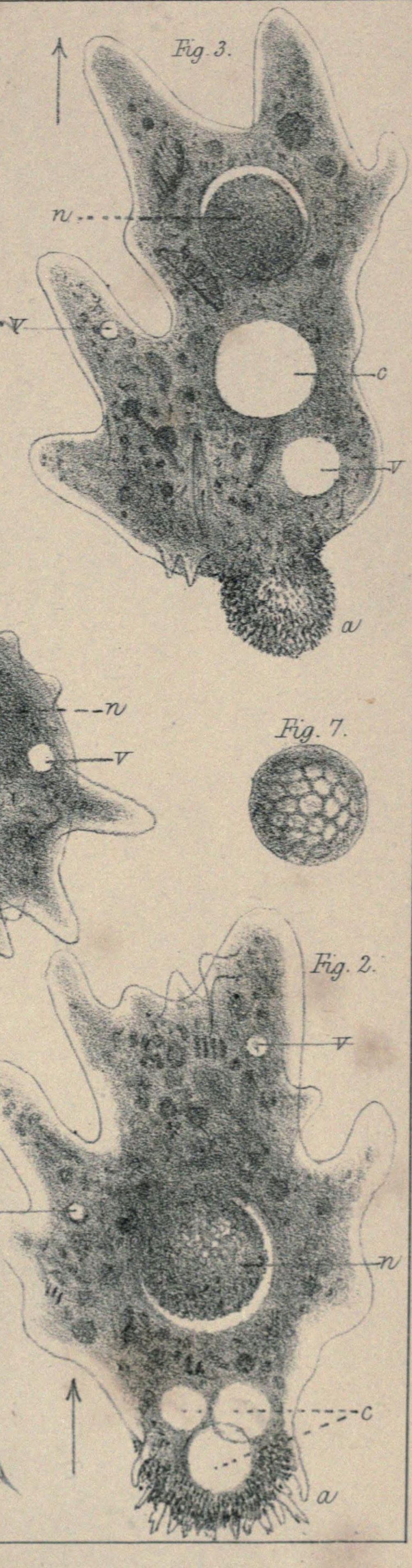


Fig. 1.

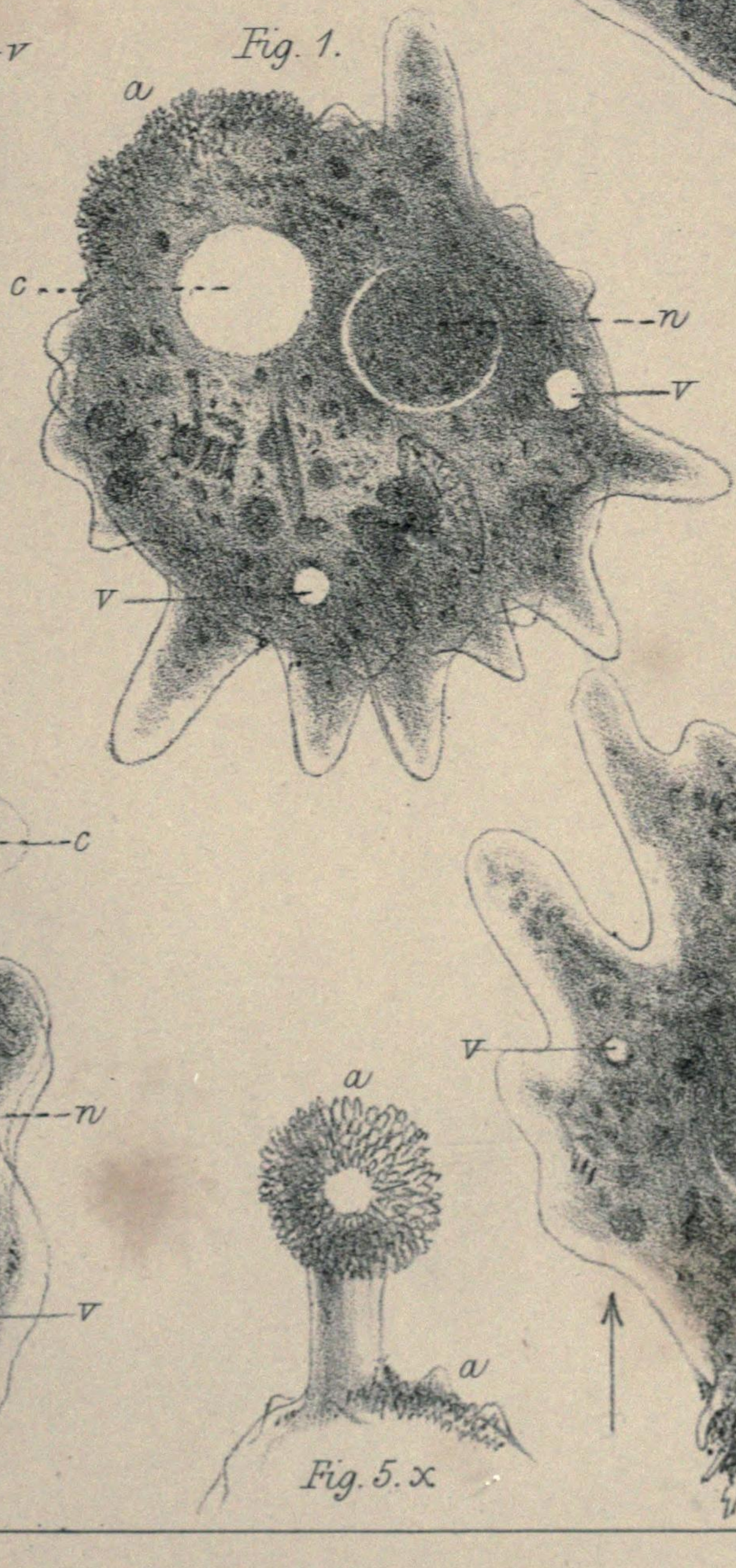


Fig. 7.

Fig. 2.

Fig. 5.

Fig. 5. x

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