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MISCELLANEOUS.

Pelomyxa palustris, a freshwater Amœboid Organism.

By Dr. RICHARD GREEF.

THE genus which forms the subject of this memoir was briefly described by the author in 1870, under the name of *Pelobius*; but this denomination has been abandoned by him, on account of its being previously applied to a genus of Coleoptera.

Pelomyxa palustris, the only known species, is found abundantly at all seasons at Bonn and Marburg; but it is in spring and the beginning of summer that it seems especially to develop itself; and it then covers the upper layers of the mud in great masses. It is observed in the form of little greyish bodies averaging 1 millim. in diameter, but sometimes attaining 2 millims., or even more. The smallest individuals are little points, scarcely visible with the simple lens.

Under the microscope the contracted *Pelomyxa* usually appears spherical, ovoid, or lenticular. It is composed of protoplasm, in which two layers of different nature may be distinguished—a cortical layer, and a parenchyma.

The outer layer, which appears to be pure protoplasm, is hyaline, homogeneous, and of a more viscid consistency than the parenchyma. It swells up into rounded vesicles projecting at the surface of the mass, and sometimes lobed or digitate, into which the inner surface penetrates as into a sac. These processes creep or flow by amœboid movements, which cause the advance of the whole *Pelomyxa*.

The inner parenchyma is of a more fluid consistency, and so closely filled with vacuoles that it appears quite reticulated. It seems only to take a passive part in the movements, and is merely carried in one direction or another as mobile contents under the action of the contractions of the outer layer. It is this inner substance that contains all the other parts, both those belonging to the organism itself and those which have penetrated from without. The very dark coloration which it often presents is due to the nature of the ingested food, which consists of animal and vegetable substances, to which a great quantity of grains of sand and fragments of mud is added.

The vacuoles are of different sizes, and more or less closely packed; and they constantly change their positions under the influence of the amœboid movements of the whole body. They are simple cavities, the perfectly clear contents of which rarely contains a few dark granules and is of a totally different nature from the enveloping substance. Dr. Greef believes that they contain nothing but water.

Besides the vacuoles, there are in the inner parenchyma three sorts of distinct bodies—which Dr. Greef names *nuclei* ("Kerne"), *shining bodies* ("Glanzkörper"), and *bacilli* ("feine Stäbchen").

The nuclei, which are always disseminated in great quantities
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among the vacuoles, are thin-walled, usually spherical bodies, 0.012 millim. in diameter, with hyaline contents, more or less furnished with dark granulations. By the examination of series of specimens, Dr. Greef convinced himself that these granulations become converted into larger rounded bodies, within which a punctiform centre may be recognized. This centre enlarges simultaneously with the body which contains it, and soon leaves nothing more than a thin ring surrounding it. The envelope of the mother nucleus appears finally to burst under the constantly increasing influence of the nucleoles, which are found scattered in great numbers side by side with others still contained in their mother nuclei. The internal cavity of the nucleole constantly enlarges, so that the peripheral layer completely disappears, and there remains a simple, spherical, hyaline brilliant corpuscle with distinct contours.

These bodies, when set free, continue to grow in the interior of the *Pelomyxa*; and it is probably from them that the *shining bodies*, which must be regarded as the zoospores of *Pelomyxa*, originate. These shining bodies, which are easily recognizable by their aspect and size even under a low magnifying power, are disseminated through the inner parenchyma in still greater abundance than the nuclei. Most of them are spherical; but some are oval or pyriform, or even irregular; the smallest are not more than 0.006 millim. in diameter, and correspond to the corpuscles originating from the nuclei; the largest are 0.06 millim. in diameter. They consist of a solid shining capsule, with perfectly hyaline and homogeneous contents. These shining bodies seem to be able to multiply in the interior of the *Pelomyxa* itself, by a constriction which separates them into two often very unequal parts. Otherwise no important change is to be observed in them so long as they are still enclosed in the inner parenchyma. It is outside this that they must continue their transformations.

A *Pelomyxa*, which seemed to be dead and on the point of becoming decomposed, presented to Dr. Greef a totally unexpected spectacle. All round the animal there appeared a considerable number of little Amœbæ, which soon surrounded the body of their parent in close-set bands. All these Amœbæ had the same aspect and the same dimensions, and executed the same movements. With a high power it was easy to detect in their interior a nucleus with its nucleoli, and a contractile vesicle. The constantly increasing circle of the Amœbæ gradually dispersed; and in about half an hour the movements became slower and feebler. Instead of amœboid contractions of the whole body, nothing was to be seen but the extrusion of a few isolated, hyaline, lobed or digitate processes. The little Amœbæ soon contracted, and became spherical or pyriform. Then appeared a long undulating filament, which effected their transformation from the Amœboid to the Flagellate form. Dr. Greef saw them move by means of this flagellum; but he was unable to trace their ultimate destiny. It is consequently impossible to say whether the Flagellate form is developed directly into a *Pelomyxa*, or, as Dr. Greef thinks is more probable, only attains the latter phase after having passed

again through the form of an Amœba. The little Amœbæ always issue perfectly formed from the body of the *Pelomyxa*, and they seem to originate from the shining bodies. The latter, therefore, must be regarded as germs or spores, originating in the nuclei.

Besides the nuclei and the shining bodies, there are in the parenchyma of the *Pelomyxa* innumerable fine hyaline bacilli, which are generally not more than from 0.006 to 0.008 millim. in length. They are found free among the vacuoles, and often also adhere in great numbers to the whole surface of the shining bodies. Dr. Greef sometimes thought that he could perceive transverse striæ at their surface and a longitudinal canal in their interior; but he can assert nothing positive upon these points. Reagents prove that they are composed of an organic substance.

Dr. Greef concludes his memoir with some considerations on the affinities of *Pelomyxa*. He remarks that this creature resembles the plasmodium of the Myxomycetes, but that this plasmodium only represents a transitional state due to the coalescence of amœboid spores, from which afterwards originates an organism of a much more complex structure, while the *Pelomyxa* represents the phase of of complete development, having numerous nuclei in its interior. *Pelomyxa* is consequently a multicellular organism which represents a group of amœboid creatures with multiple nuclei, belonging to the class Rhizopoda, and allied in many respects to the Myxomycetes.—*Archiv für mikrosk. Anat.* vol. x. (1873), p. 51; *Bibl. Univ.* Dec. 15, 1873, *Bull. Sci.* p. 358.

On Megapodius trinkutensis, Sharpe.

By ARTHUR, Viscount WALDEN, P.Z.S.

In the 'Annals' of this year (xiii. p. 448), Mr. Sharpe described a Megapode from Trinkut island (Nicobars) as belonging to a species distinct from *Megapodius nicobariensis*, Blyth.

At least four of the islands composing the Nicobar group are inhabited by a species of Megapode; but as Mr. Blyth did not record the name of the island which furnished him with the type of his species, it is impossible to say which is the habitat of *M. nicobariensis*. A considerable series of individuals has recently reached me—consisting of six males, four females, and one unsexed from Camorta island, nine males, four females, and two unsexed from Nangcowry island, two males, three females, and one unsexed from Katschal island, and seven males, seven females, and one unsexed from Trinkut island; and they all belong to one species. Every phase of plumage is represented; and several of the Trinkut examples exhibit the French-grey tinge on the throat and sides of neck, as do some, but not all, from each of the other islands. *Megapodius trinkutensis* must therefore be regarded as equal to *M. nicobariensis*.

Three of the forty-seven individuals I have received present a feature not hitherto recorded, namely a tendency to assume a naked callosity on the crown, as is observable in *Megacephalon maleo*. One, a female from Katschal island, has the occiput and vertex naked of