

of M. D'Orbigny that the place of these organisms might be among the lowest instead of among the highest of the Invertebrata."

The true nature of the Foraminifera, and their relationship with *Amaba*, *Diffugia*, and other animals of the kind, was first recognized by the accurate observer M. Dujardin.

In the *Annales des Sciences Naturelles* for 1835, there are two articles from M. Dujardin, entitled "New Observations on the Microscopic Cephalopods" and "New Observations on the pretended Microscopic Cephalopods". The author remarks that he has observed several genera of these animals from the Mediterranean in a living condition, notably *Miliola*, *Rotalia*, etc. The segments of the shell successively augment in volume, and are occupied with a red or orange-colored animal matter, of the consistence of thick mucus, very contractile, and susceptible of lengthening into threads. In conclusion, the author remarks that "if one wishes to assign to these animals their place in the animal kingdom, in considering the absence of organs, the homogeneity and simplicity of their material—a sort of mucus endowed with spontaneous movement and contractility—one is led to place them in the lowest rank. I first designated them under the name of *Symplectomères*, only having in view the succession of similar parts rolled together, in the known species; but the observation of *Gromia* has led me to prefer the name *Rhizopods*, to express their singular mode of creeping by means of threads, which extend and branch like roots."

Dr. Carpenter divides the Foraminifera into two suborders: the *Imperforata* and the *Perforata*, founded on the circumstances that in the former the shell has mostly but a single orifice of communication with the exterior for the emission of the pseudopods, while in the latter the shell has its outer walls everywhere minutely perforated for the same purpose.

The sarcode of the Foraminifera consists of a viscid protoplasm, usually more or less colored yellowish, brown, or red; the color being deepest in the earlier formed chambers of the shell, and becoming less towards the last one, in which it is very feeble or absent altogether. The protoplasm contains granular matter, and vacuoles, or drops of more liquid matter than that of the general mass of the sarcode. Nuclei have commonly been supposed to be absent, but recent researches of Hertwig* and Schulze† have proved their existence. The pseudopods of the Foraminifera extend as

* *Jenaische Zeitschrift*, x, 1876, 41.

† *Archiv f. Mikros. Anat.* 1877, 9.