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OF

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EDITED BY

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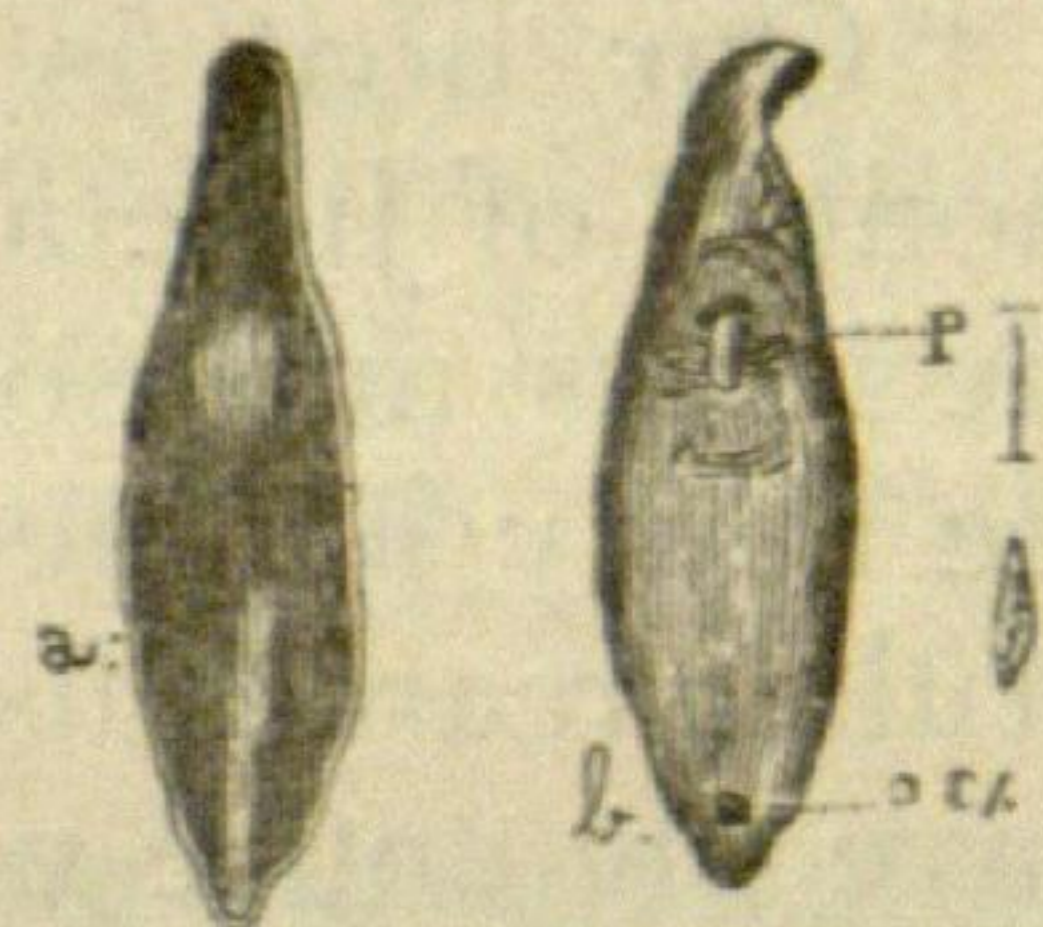
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rorchus Val., at Messina. Also, in November last, *Malacocephalus lævis*, and a species that is probably new, and may be allied to *Malacosteus*. This fish is deep black, with small eyes, and skin free from scales, and is evidently abyssal. A specimen of *Notacanthus*, perhaps the rarest of fishes, was also found. It is evidently nearly allied to *N. rissoanus* De Fillippi, yet differs from the description of that species. The harbor of Messina is a most favorable spot for obtaining deep-sea fishes, in stormy weather such forms as *Chauliodus*, *Stomias*, *Argyropelecus*, *Microstoma*, *Coecia*, *Maurolicus*, and ten or twelve kinds of *Scopelus* are thrown up in hundreds.

A CAVE INHABITING FLAT-WORM.—In May, 1874, while investigating the cave-life of the Carter caves in Eastern Kentucky under the auspices of the Geological Survey of Kentucky, Professor N. S. Shaler, director, I discovered in a brook in X cave, a Planarian which belongs to the Rhabdocœla, while the Planarian found by us in the brook in Mammoth cave is a Turbellarian. This is figured in our "Zoölogy" p. 141 under the name of *Dendrocœlum percaecum*. The Rhabdocœlous worm found in the Carter caves belongs near *Vortex*, and it may provisionally be called *Vortex cavicolens*. The body is flat, elongated, narrow, lanceolate oval, contracting in width much more than is usual in *Vortex*. The pharynx is situated much farther back from the anterior end of the body than usual in *Vortex*, being placed a little in front of the middle of the body; it is moderately long, being oval in outline. The body behind suddenly contracts just before the somewhat pointed end. The genital outlet is about one-half as wide as the pharynx and orbicular in outline. Though described from two alcoholic specimens I can discover no eyes, nor do I remember seeing any when it was living, it was, when alive, white and apparently eyeless. Length 4^{mm}; breadth 1.5^{mm}. Found in X cave, one of the Carter caves, Eastern Kentucky.

This worm may not prove to be a genuine *Vortex*, the species of which are broad and blunt in front, with the pharynx much nearer the front end than in the present species, which is therefore only provisionally placed in the genus *Vortex*. In *Vortex cæcus* (Ersted) the eyes, as the specific name implies, are wanting, but most of the species have eyes. As our species occurred in a brook in a dark cave, it would naturally, as in the case of the Mammoth cave eyeless white Planarian, be eyeless, and as a consequence of losing its eyes become white. Schultze in his *Naturgeschichte der Turbellarien* states that *Vortex viridis* in winter was generally without chlorophyll bodies and wholly white, but that in April the white individuals are rare. He then adds. "Kept for a considerable time in darkness the green animals become through bleach-



Planarian Worm, Carter caves. *a*, dorsal; *b*, ventral; 6 × magnified; *c*, nat. size, ventral; *p*, proboscis.

ing and the disappearance of the chlorophyll almost colorless."—*A. S. Packard, Jr.*

THE METAMORPHOSIS OF PENÆUS.—Scarcely another fact in morphological science, standing alone, exceeds in interest, says Professor W. K. Brooks, in the Johns Hopkins University circulars for November, 1882, the discovery that Penæus, a Decapod, passes through a Nauplius stage. Those familiar with the literature of the subject will recollect that Fritz Müller kept under observation until it changed into a Protozoëa, a Nauplius which he captured at the surface of the ocean. He also secured in the ocean, a very complete series of larvæ, through which he identified the Protozoëa with a young Macrouran with the characteristics of the genus Penæus. During the past summer, at the marine laboratory of Johns Hopkins University, established at Beaufort, N. C., Professor Brooks has obtained the youngest Protozoëa stage of Penæus, the stage which Müller actually reared from the Nauplius." I have had the good fortune to rear this larva in the house, and to witness in isolated captive specimens every one of the five molts between the first Protozoëa and the young Penæus.

"Our boat is too small for work outside during the windy months of June and July, and as the ripe females do not come into the inlets and sounds, I have not been able to obtain the eggs or the newly hatched young; but this is the less important, as Fritz Müller reared his first Protozoëa from a Nauplius, so that we now have the entire metamorphosis from actual observation."

[In 1871 we visited Charleston, S. C., partly for the purpose of working upon the development of Penæus. Unfortunately our visit, which was early in April, was too soon to enable us to find the prawn with eggs. None of those brought to the Charleston markets in April were spawning. We were informed that the prawn does not have eggs until May, probably the latter part of the month. The negroes catch them with sweep-nets.—*A. S. Packard, Jr.*]

THE GROWTH OF THE MOLLUSCAN SHELL.—The structure of the molluscan shell has been studied by means of sections of adult shells by Carpenter and others, and they have found that it presents an outer membranous horny epidermis and an internal stony portion. Such a method could not give any idea of the actual process of shell formation and a knowledge of this could be gained only by study of the first steps. To this end, edges of the shell were snipped away and a thin glass circle thrust between the animal and its shell, care being taken to prevent injury to the mantle. After the lapse of twenty-four hours the shell was opened and the glass circle carefully examined, others were allowed to remain two days, or three days, or for periods of weeks.

In twenty-four hours it was found that a film had been left upon the circle; in forty-eight hours, this film was plainly stony. The