

and named *E. Bavaricum*; also from Saxony, Bohemia, Hungary, and Pargas in Finland. The specimens of *Eozoon* were first supposed to be *Stromatopora* corals (Logan's *Rep. Geol. Can.*, 1863, page 49), and afterward announced as *Rhizopod* in structure by Dawson; and this conclusion has since been sustained by W. D. Carpenter and others. But *Eozoon* specimens have also been examined microscopically by good observers, among them King and Rowney, and Möbius, who have not found the supposed foraminiferal characters. Quite recently, in 1891, the Tudor specimens were examined by J. W. Gregory with this conclusion.

Doubts are excited also by the close resemblance in structure to specimens that are of mineral origin; by the unequal thickness of the calcareous layers and the interstices; and by the fact that serpentine of later formations has afforded similar forms. It is objected to on the ground that this mineral is often minutely interlaminated with fibrous serpentine or some other mineral, showing that the soft amorphous material, as it solidified, sometimes contracted and divided into thin laminae, leaving spaces between to receive depositions of any kind; in the *Eozoon* the infiltrating material was usually calcareous.

Notwithstanding the imperfection of the evidence, the existence of *Rhizopods* and other *Protozoans* before the close of Archæan time is generally believed.

The calcium phosphate (apatite) of the rocks, which is common in some limestones, is also supposed to be of organic origin, because a constituent of organic tissues and of some shells. Its abundance also in the iron ores favors this view, inasmuch as the beds of ore are believed to be marsh productions. But the phosphate is distributed in grains through many igneous and other crystalline rocks, and the evidence may only prove that it was present in solution in the sea-waters of the era.

Above the grade of *Protozoans*, the type which is most likely to have existed in the later Archæan is that of *Rotifers*; for there is good reason for believing, as stated on page 423, that from this group passed off independent successional lines of species to *Worms*, *Limuloids*, *Crustaceans*, and terrestrial *Arthropods*, and probably also to *Bryozoans*, *Brachiopods*, and perhaps other tribes.

ECONOMICAL PRODUCTS.

The chief economical products of the Archæan terranes are: (1) Gold, platinum, diamond; (2) Iron ores; (3) Copper, and other ores; (4) Corundum or emery; (5) Graphite; (6) Architectural materials, especially granite and marble; (7) Apatite or calcium phosphate for fertilizing purposes; (8) Feldspar for porcelain-making; (9) Mica for the doors of lanterns, stoves, etc., and various other uses; (10) Zircon and monazite.

The iron ores are among the most valuable. They sometimes contain too much titanium; and occasionally the proportion of disseminated grains of apatite affects their value. This mineral may be distinguished by its greenish or grayish color and by its being soft enough to be scratched by the point of a knife-blade. The American corundum (Al_2O_3) comes mostly from North Carolina and Georgia. A mass weighing 400 tons was formerly obtained in the rocks of Chester County, Pennsylvania. The mineral is ground up and used for emery, it being the same compound as emery, but in a purer form.