of the United States National Museum, and a number of thin sections have lately been made from some of them that show the details of structure. An examination proves that the type species is generically the same as *Archæocyathellus Rensselaericus* of Ford, and that it is generically identical with *Archæocyathus profundus* of Billings. The septa join the inner wall regularly when there is no vesicular structure within it, but when the latter is present the septa terminate irregularly and the inner wall is imperfectly developed. In the lower and smaller end both walls and septa are regular, the vesicular structure and irregular growth coming in with the growth of the individual. The structure is shown by the figures of plate iv.

Sometimes the outer wall and septa are broken away, leaving the vesicular interior. I find that the form described as *E. gracile* by Mr. Meek is the result of such an accident, as it corresponds in structure to the vesicular interior of other specimens of *E. Whitneyi*.

We also observe that the thin arched dissepiments between the septa increase in number with the growth, and that where two dissepiments partition off a cavity between the septa a pore opens into it through one of the adjoining septa. The number of septa in sections of the same diameter varies considerably, eight to fourteen in sections $1\frac{1}{6}^{mm}$ in diameter. The thickness and direction of the septa are also variable in different specimens and in different parts of the same specimen. Frequently the differences might be taken to be of specific value, but I regard them as variations of growth caused by local influences on the individual sponge, such as being crowded by its fellows, fragments of other organisms getting into it, variation in supply of food, &c.

In a thin section, tubes two-fifths of a millimeter in diameter appear as simple rings crossed by light bands, which are the interseptal spaces. In other small sections the entire section is solid.

As the genus Archæocyathus is restricted to the type species *A. Atlanticus*, *E. Whitneyi* falls back into the genus proposed for it.

Formation and locality.—Middle Cambrian. Silver Peak, Western Nevada. The species occurs in a limestone and calcareous shale, associated with *Archæocyathus Atlanticus*, *Hyolithes princeps*, *Olenellus Gilberti*, &c.

ETHMOPHYLLUM PROFUNDUM Billings.

Plate 1, figs. 1*a–c*; pl. ii, figs. 3, 3*a*, *b*; pl. iv, fig. 3.

Archæocyathus profundus Billings, 1865. Pal. Foss., vol. i, p. 4.

Original description.—"Elongate, turbinate, more or less curved, the basal one or two inches slender, then rapidly expanding to a diameter of from one to four inches, then becoming cylindrical. The form is that of a large *Cyathophyllum* or *Zaphrentis*. The cavity of the cup extends in depth nearly to the base. The radiating septa are thin and closely crowded together, there being eight or ten in the width of three lines. The surface is annulated by strong rough ridges from three to six lines