APPENDIX A.

PALEONTOLOGY.

1406. In the course of this work quite a number of new species have been named, and some briefly described; and at the end of the volume the figures of several of them are presented on the plates. It was my purpose to describe them in full in this Report, but it is found to be impracticable. The descriptions will appear hereafter in the Journal of Science.

1407. I add a few notes with reference to certain species:

(1.) *Carinaropsis carinata* in the table on page 289 has been described by Mr Hall as *Carinaropsis (Phragmostoma) cunulæ,* in the Fourteenth Regent's Report.

(2.) Mr. Hall suggests, in a letter received since page 328 was printed, that *Orthis Halli,* in the table on the page referred to, is his *O. strophomenoides,* of Vol. III, of Pal. N. Y. Two of the Tennessee specimens were sent to him. They do not, however, show the internal structure. The point can be determined so soon as specimens showing this are met with.

(3.) The substance of the following remarks and descriptions were communicated by the author, many years ago, to the American Journal of Science. In the original paper the varieties of *Tetradium fibratum, apertum* and *minus,* were considered species.

The genus *Tetradium,* has been characterized by Prof. Dana in his great work on Zoophytes.* His description and remarks are as follows:

"Coralla massive, consisting of 4-sided tubes, and cells with very thin septa or parietes; cells stellate with four narrow laminæ.

"This genus is near Receptaculites, but differs in having very thin parietes and four distinct rays within the cells, one to each side. The specimen answering to the description, is a fossil of uncertain locality, in the collections of Yale College, New Haven. The cells are about half a line in breadth. The name, from the Greek, τετρας ,*four,* alludes to the quadrate structure."

To us this genus is of great interest, from the fact that it is a common form in the limestones of the *Central Basin* .

*United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842, under the command of Charles Wilkes, U. S. N. Vol. 8th, page 701.

In addition to the characters given above, we add the following: The *tubes,* in the different species, vary from ¼ of a line to nearly a line in breadth; they are very long, and are most frequently united throughout laterally, forming massive coralla resembling more or less those of Favosites anrl Chætetes; sometimes, however, they are united in single intersecting series, as in *Halysites catenulatus,* Linn.; not unfrequently, too, the tubes are isolated, or only united at irregular intervals, thus forming loose fasciculated coralla resembling certain forms of Syringopora.

The *isolated tubes* are nearly quadrangular, the edges being more or less rounded. A slight linear depression down the middle of each side externally, opposite the lamellæ. Fig. 1 will serve to give an idea of the transverse, or horizontal section of one of these tubes. In the massive specimens, the horizontal sections of the tubes are square, or nearly so. In all of the species, the walls are more or less rugose.

1.

Separately growing tube of Tetradium; transverse section, magnified 3 or 4 times linear.

The increase appears to be by the division of the tubes, the latter splitting sometimes into two cell-tubes, not unfrequently, perhaps, into four; opposite laminæ unite and form the new walls of the young cells, each of which is, in the mean time, supplied with its four rays.

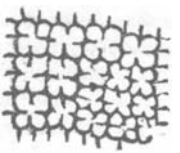
Among the numerous specimens of this genus seen, I have met with but one which shows clearly the presence of transverse septa. This is a fragmentary specimen of the first species described below. In it, the septa are distant about twice the breadth of a tube; but few, however, are seen, and these are confined to one end of the mass.

This group is regarded as being allied, in some respects, to the *Favositidæ,* while on the other hand, the cruciform arrangement of the lamellæ unite with the *Zoantharia rugosa* of MM. Milne Edwards and Haime ; in fact, it appears to afford an interesting type of the quadripartite character of the lamellæ, first pointed out by these distinguished authors, in many palæozoic corals.

I give the following species, which, as well as the genus itself, so far as I know, are confined to Lower Silurean rocks.

1. *Tetradium fibratum,* Safford, *variety A.* (Fig. 2.) Coralla massive, hemispherical, or flattened hemispherical, composed of diverging tubes. Cell-tubes four-sided, with thin, and slightly rugose walls; the four lamellæ distinct, nearly reaching the centre of the tubes; breadth of full grown tubes usually about, or but little more, than half a line, varying occasionally from one-third to three-fourth of a line. Transverse septa usually absent. A few have been seen in one specimen, which were about twice the breadth of a tube apart.

2.



Transverse section of a few tubes of T. fibratum, magnified.

This species occurs abundantly throughout the upper half of the Lower Silurean rocks of Middle Tennessee, associated with *Columnaria stellata,*

Hall, *Ambonychia radiata,* Hall, and other Hudson River species. Large masses, a foot or two in diameter, are met with. The calcareous specimens often resemble, in a weathered longitudinal section, a fossilized, but previously somewhat macerated mass of woody fibre, and hence the name of the species.

Variety B, apertum—Tubes isolated or fasciculated, or else united in linear series which often intersect, forming irregular reticulations; breadth of tubes about half a line; lamellæ as in variety A.

This includes certain open, loosely constructed corals. Two sub-varieties may be designated. These run into each other in some specimens.

(a) Masses composed of separate tubes, occasionally united by their sides. These forms often resemble *Syringopora.*

(b) Masses composed of tubes arranged in linear series, the latter intersecting, and forming masses like those of *Halysites catenulatus,* Linn.

The first sub-variety is abundant in the middle part of the Lower Silurean Series of the Basin. The second is found in the upper half, as well as near the base. I have observed the same species in Kentucky.

Variety C, minus.—I include here, massive specimens, (generally small,) the tubes of which are only from one-fourth to one-third of a line in breadth. The tubes in some specimens, are quite regular, in others, though generally four-sided, are more or less irregular, and have the aspect on the upper surface of Chætetes. Lamellæ as in variety A.

I have occasionally seen this variety in the upper division of the Lower Silurean in Middle Tennessee, as well as in Kentucky.

2. *T. columnare,* Hall; Syn. *Chætetes columnaris,* Hall. Pal. of N. Y., vol. I, p. 68, Pl. XXIII, Figs. 4, 4a—Mr. Hall's species, we think referable to this genus. It differs from *T. fibratum* in the following particulars: The tubes are not as uniformly four-sided, nor are they arranged with equal regularity; the walls are more strongly rugose; the lamellæ appear to have been more delicate, and are generally not to be seen; traces of them, however, can, in most instances, be found upon close examination. The four-sided character of the tubes is sufficiently well marked to justify this reference, in connection with the fact that traces of the lamellæ can often be detected.

This species is associated with the last, and occurs, in addition, lower in the series, with *Columnaria alveolata* Hall. It is a common fossil in our Central Basin.