oblique and rhomboidal in the specimens, but this is probably due to pressure. The horizontal spicules seem to be triacerate in form, and much shorter than those of the vertical system, though of very different lengths. They are sometimes in bundles and sometimes solitary.

In parts of the substance, apparently within the reticulate wall, may be seen a few cruciform spicules, and flocculent patches apparently of very small spicules, which seem to have been mostly internal and most abundant toward the base, but cannot be distinctly made out.

The whole of the spicules are completely pyritized, and appear under the microscope to be made up of rows of cubical crystals of pyrites. They were probably originally siliceous, but this need not excite surprise, as the silica of such spicules is in a condition which facilitates solution, and in some modern sponges the spicules are not purely silicious, but contain some animal matter. I have also noticed other cases in which silicious palæozoic sponges have experienced this change, while in many specimens the spicules have entirely disappeared.

This is the case with the Erian or Devonian sponges of the genus *Dictyophpton* and allied genera, which, owing to their apparently membranous character, I at one time believed to be fucoids, but abandoned this idea on seeing the specimen of *Uphantenia* (*Physospongia*, Hall) which Prof. Whitfield was kind enough to show me in the New York Museum in July, 1881. In a note communicated to Prof. Whitfield in August, 1881, I have made the following remarks on the pyritization of sponges :—

"The most puzzling fact in connection with the original silicious character of these sponges is their mineral condition, as being now wholly replaced by pyrite. Carbonaceous structures are often replaced in this way, and so are also calcareous shells, especially when they contain much corneous matter, but such changes are not usual with silicious organisms. If the spicules were originally silicious, either they must have had large internal cavities which have been filled with pyrite, or the original material must have been