account those produced on the original structures of these sponges by what may be termed the mechanical influences of fossilization. There can be no doubt that they were hollow sacci-form or vasi-form structures with very delicate walls of spicular tissue, supporting the soft animal mem-They existed at the surface of the soft ooze of the branes. sea-bottom, probably their basal portions were embedded in it, and they were furnished with elongated spicules whose extension into the mud served to anchor them in one spot. After the death of the animal, and the decay of the soft tissues, the delicate skeletal framework would be gradually buried in the accumulating sediments, until by their weight it became completely flattened. Under favorable circumstances, the outline of the sponge and the natural arrangement of the spicular skeleton would be preserved, and this is fortunately the case with the specimens of Cyathophycus from the Utica shale, and to a partial extent with one of the specimens of Protospongia tetranema. More frequently, however, probably owing to currents and other causes acting at the surface of the ooze, the skeletal framework is partially or wholly broken up, so that only small patches . of the connected skeleton, or merely the dislocated and detached spicules irregularly scattered over the rock surface remain for determination, and this is the present condition of the majority of the specimens from the Quebec group. For some reason, probably connected with the arenaceous character of the rock in which they occur, the nearly allied sponges belonging to the Devonian genus, Dictyophyton, Hall, usually retain their outer forms complete-that is, without being compressed-but most of these sponges exhibit only internal casts of their spicular skeleton, so that at present we know very little of their original structures.

As already mentioned, nearly all these Quebec sponges belong to the sub-order of the Hexactinellidæ, in which the fundamental type or elementary spicule of the skeleton consists of six equal rays, radiating from a common centre at right angles to each other, forming three equal axes. But this typical form is subject to great modifications