

octahedral nodes. *Joannella*, Schmidt, is distinguished by its narrow meshed network and the marked fissures associated with this character. In one species of the new genus *Scleroplegma* (*Scleroplegma laterna*) there are perforated octahedral nodes, while in the other species of the same genus the nodes are solid. In *Volvulina sigsbei*, O. Schmidt, which is distinguished by the knotted cords of the siliceous network of beams, Schmidt thinks that he can prove the non-fixity of certain characters of the Dictyonine lattice-like tissue, characters which have been principally used by Zittel in the classification and determination of fossil Hexactinellida. While, namely, in some parts of the lattice network smooth rays and rough knots appear, in other regions of the same specimen the rays are also rough. Many specimens of the same species exhibit rough rays and smooth knots, the exact reverse of what has just been stated above. Schmidt has also found that the form of the meshes is very variable and uncertain, they are sometimes cubical, sometimes predominantly polyhedral, sometimes quite irregular.

Of Euplectellidæ Schmidt mentions, besides *Euplectella jovis*, which is a species nearly related to *Euplectella suberea*, Wyv. Thomson, a new genus *Regadrella*, including the single species *Regadrella phœnix*, which is devoid of the siliceous tuft and is fixed to the rocky substratum by a firm base. Though in this form a very constant character of the Lyssacina is evidently absent, it must be noted that other forms occur which are quite firm and compact beneath, lattice-like in the middle, and loosely constituted above, such as, for example, *Hertwigia falciformis*, Schmidt, and *Rhabdoplectella tintinnus*, Schmidt, and these were direct transitional forms between Dictyonina and Lyssacina.

Of the genus *Hyalonema* Schmidt has described only fragmentary pieces. The form described by him as *Asconema kentii* is certainly a species of *Hyalonema*.

The then little known structure of the soft body of the Hexactinellida was, in 1880, elucidated by my¹ investigation of some well-preserved specimens of *Euplectella aspergillum*, which were given to me by Sir Wyville Thomson from the treasures of the Challenger expedition.

In a subsequent study of the Hexactinellid material from the Gulf of Mexico, which had been already utilised by O. Schmidt, but which was re-examined by Weltner² in 1882, the structure of the peculiar skin and covering layers was especially considered. This had, it is true, been previously described by Zittel in several fossil forms, but in living forms it had hitherto been insufficiently known, and had been investigated, in fact, only in a few cases, such as in *Aphrocallistes* by Zittel, in *Myliusia* by Marshall, and in *Dactylocalyx pumiceus* by Sollas. Weltner was able to demonstrate the presence of these structures in numerous modern Dictyonina, e.g., in *Farrea*, *Syringidium*, *Aphrocallistes*, *Volvulina*, *Joannella*, *Margaritella*, *Scleroplegma*, and *Cystispongia*. Like Zittel he distinguished "covering layers, dependent and independent of the lattice-

¹ *Trans. Roy. Soc. Edin.*, vol. xxix., 2, p. 661.

² Weltner, *Beiträge zur Kenntniss des Spongien*, 1882.