far as we know, a contrast to the subsequent, and late union of the various spicules in certain Lyssacina. In the latter it is deferred till after the differentiation of the body has made considerable progress, and then only gradually develops from a given centre in the already perfected body.

But although I regard this difference as most conveniently diagnostic of the two groups, I must allow that it also represents only a qualitative difference. The dictyoninal spicules of the Dictyonina were once, as Marshall first clearly demonstrated for *Aulocystis zittelii*, free spicules, and the union gradually progresses from the younger to the older portions of the body. We also know of many Lyssacina with connected skeletal framework, like *Rhabdodictyum delineatum*, O. Schmidt, *Aulocalyx irregularis*, F. E. S., and especially the above-mentioned *Euryplegma auriculare*, F. E. S., in regard to which we are by no means certain, whether, as in species of *Euplectella* and some other Lyssacina, the process of fusion or the formation of synapticula take place some time after the differentiation of the sponge-body, or shortly after its incipient formation. In regard to those Lyssacina in which an abundant fusion of spicules forms a compact base attached to solid bodies, it is very probable that the fusion of the spicules begins somewhat early at the lower end, and progresses gradually upwards to the upper margin. The upper end of many Lyssacina with latticed framework has been long since carefully described, as O. Schmidt has done for his *Hertwigia falcifera* and other Hexactinellids, and known to consist solely of loose isolated spicules, while the lower end exhibits a well-developed fusion.

We thus see that the relation at present demonstrable between extant Lyssacina and Dictyonina does not suggest a long-established separation of the two groups, but rather a gradual modification of certain Lyssacine groups into Dictyonina, while others have remained at the undoubtedly older Lyssacine stage.

We do not, indeed, know the development of the Dictyonina, but it is to be expected that they possess at first only isolated spicules, and recapitulate probably for a short time the Lyssacine stage, before a regular fusion of hexacts occurs, and the typical dictyonal characteristics set in.

It appears to me further a very noteworthy fact that the results of my bathymetrical statistics show that the Lyssacina occur predominantly in the greater depths and far from the coast in Mid Ocean, while the Dictyonina are chiefly found in moderate depths and near the coast. The Hexactinellids of the Challenger Expedition, which were obtained from the greatest depths belong to the simplest and most typical Lyssacina, as for example certain species of *Holascus* and *Bathydorus*, especially *Bathydorus fimbriatus*, which was dredged in Mid Pacific from a depth of 2900 fathoms.

Furthermore, in some species of certain Lyssacine families, such as Euplectellidæ and Rossellidæ, we find in the very irregular and long deferred fusion of the larger spicules into a compact connected framework, what may be regarded as an incipient development of a dictyonal skeleton.