II. Sexradiate skeleton spicules, with rays making any angle with each other. Aphrocallistidæ, . . .	*Aphrocallistes*, *Dactylocalyx*, *Iphiteon*, *Stromatopora* (*Callodictyon*, Sollas, n. gen.) *concentrica*.
III. Skeleton spicules, cemented into ladder-like fibre. Euplectellidæ, ...	*Euplectella*, *Sympagella*.

Zittel's epoch-making work on fossil Sponges[1] contains very accurate descriptions, not only of the form of the body and nature of the surfaces, but of the system of canals that penetrate the body, and especially of the fine microscopic structure of the siliceous framework. The flesh spicules which lay loosely in the soft tissues, and were thus, for the most part lost, could not of course be so closely studied.

As the main basis of his classification Zittel emphasised the differences in the modes of union exhibited by the skeletal spicules, a basis of division which had been already employed by Saville Kent and Carter. He distinguished those forms "in which the skeletal spicules usually remain isolated and are only united by sarcode," from those "in which the skeletal spicules are fused in a regular manner and form a continuous lattice-work with cubical or polyhedral meshes." The former he named Lyssacina, the latter Dictyonina.

That intercommunication of the lumina of the axial canals throughout all the spicules fused into the lattice-like framework, which had been observed by Marshall in *Sclerothamnus*, was not corroborated by Zittel, either in any fossil Hexactinellid or even in *Sclerothamnus* itself. It seemed to him, further, that the formation of a special group of Monacidæ, in Marshall's sense, was unwarranted, at least as regards the division of the Dictyoninæ, but he himself formed, within the Lyssacina, from certain fossil genera, a similar group, and ranged alongside of it the Pleionacidæ and and Pollacidæ.

I will here cite the fundamental principles of Zittel's Hexactinellid system of 1878 :—

Class **Spongia.**

Order HEXACTINELLIDA, O. Schmidt.

Siliceous Sponges with six-rayed spicules, isolated or fused into a lattice-work of a hexradiate pattern. All the siliceous elements exhibit the same fundamental structure, with an axial cross formed by three central canals intersecting at right angles. In addition to the peculiar skeletal needles there are numerous isolated flesh spicules, mostly very delicate in form.

[1] *Abhandl. d. II. Cl. k. baier. Akad. d. Wiss.*, xiii., 1878.