which have lost the siliceous spicules. In my opinion, the common ancestral group of all sponges (provided that the whole class is monophyletic) has been skeletonless, and the various main groups (subclasses or orders) descending from it have acquired the different skeletal forms in different ways polyphyletically. This does not exclude the possibility that in some skeletonless sponges the want of a proper skeleton is secondary, produced by reduction.

For the sake of brevity and clearness I will here call the hypothetical common ancestral group, in which originally no skeleton was formed, Archispongiæ. To this primordial group may perhaps belong some Myxospongiæ (Halisarcidæ, Chondrosidæ) and some Psammospongiæ (Ammoconidæ, Psamminidæ). From the same common ancestral group may have arisen, as independent main branches, on one side the Calcispongiæ, on the other side a part of the true Keratosa (not descended from Silicosa), and further the Demospongiæ (Monaxonida and Tetractinellida) and the Hyalospongiæ (Hexactinellida). It is quite possible that a horny skeleton, produced by the formation of spongin-fibres, has arisen polyphyletically, independently in different groups of sponges. The now prevailing opinion of their monophyletic origin seems to me not very probable.

The nature and origin of the horny skeleton is an important point in these phylogenetical problems. In my opinion, the spongin-skeleton must not be regarded as a formation of the same order and value as the calcareous skeleton of the Calcispongiæ, or the siliceous skeleton of the Silicosa. Regarded from a general histological point of view, the horny tissue of the sponges seems to present many analogies in form and development to the elastic tissue in the higher Metazoa. The different forms of thin fibrillæ and strong fibres, simple and branched fibrillæ, isolated and reticulated fibres, bundles and networks of fibrillæ, which are found among the numerous modifications of the elastic tissue, and which arise in the maltha or the ground-mass of the connective tissue, occur also in the horny fibrous tissue of the sponges. The chemical nature is little different, and even the origin may often be similar. The strong fibres of many Keratosa are produced by series of associated spongoblasts (F. E. Schulze), but the fine fibrillæ of the Stannomidæ and the spongin-capsules and lamellæ of *Cerelasma* are certainly formed in another way. Perhaps each fine fibrilla of the Stannomidæ is the filiform product of a wandering amœbocyte, in a similar way as a dentin-fibrilla is secreted from an odontoblast. But it may also be that these and similar spongin-fibrillæ are produced by a chemical and physical alteration of the ground-mass, without the direct action of a cell, in a similar way as is the case in the fibrous cartilage.

Comparing the horny skeletons in the new Keratosa here described (especially the Stannomidæ), and in the various groups of the so-called Cornacuspongiæ, it seems to me very probable that horny fibres, as strengthenings of the maltha, have arisen in different groups of Keratosa and of Silicosa, independently one from another; it is even very probable that the fossil Pharetrones (Zittel), that remarkable group of Calcispongiæ which