will in their case be one and the same thing, but it is different in the more primitive groups, for here the resemblance of a group to a tree is unfortunately too apposite, since so many of the leaves borne by different branches are essentially similar to one another, *i.e.*, similar genera exist in the lower groups such as Sponges, which have nevertheless a different ancestry; thus the Monaxonids are evidently a highly polyphyletic order, some of them having arisen from near the root of the Demospongiæ, and others from its highest branches, and still others from intermediate points. And if we attempt to classify them according to descent we shall have to place in different groups genera which are structurally similar, and this would be equivalent to the method of a chemist who should attempt to classify a homologous series of compounds, not according to their structure, but according to the methods which he had employed to produce them. It may be urged that the similarity alleged is apparent merely, and I will not attempt to deny that this is probable; future investigations may reveal important differences at present not dreamt of, but till these are made clear, it would seem better to classify by the similarities we do perceive than by a supposed phylogeny that may be wholly illusory. It is possible that the concrescence of the choanocytes which occurs in all the higher Tetractinellids may eventually serve to distinguish them from the Monaxons proper. Those Monaxons which have descended from the various families of the Tetractinellida might then be included by some such definition as the following:—TETRACTINELLIDA, *Demosponges characterised by desmas, triænes, or tetraxons, and where these are absent by the concrescence of the choanocytes.*

But at present our knowledge of the minute characters of the Monaxons is not complete enough to enable us to judge of the value of this possibly distinctive character; in such Suberites as I have examined there is no concrescence and I hold this provisionally as completely separating this family from the Tetractinellids and as uniting it with the Monaxonids; so too there is no concrescence in the Tethyidæ, which must therefore also be assigned to the Monaxonids; on the other hand, in the purely Monaxonid Sponge *Amphius*, which on morphological grounds we conjecturally derive from the Stellettidæ, concrescence has been observed, and there would thus appear to be good reason for assigning it to the Tetractinellida as a degenerate or simplified form.[1] The characters of the choanocytes in *Placospongia* have not yet been made out, and thus although the presence of the sterraster in this Sponge would suggest its affinities with the Sterrastrosa, yet till we know whether the choanocytes are concrescent or not it may be as well to suspend judgment. For the present, therefore, I am content to use for the larger groups of Sponges names which are better defined by the contents of the group than by any form of words.

[1] There is no concrescence in *Placina*, and it is absent from species of *Tetilla*, but these are the simplest members of the order; the Suberites and Tethyidæ are Corticate Sponges and without concrescence, while all Corticate Tetractinellida present this character.