Homorrhaphidæ (Chalininæ), in the Heterorrhaphidæ (*Gelliodes*, *Toxochalina*), in the Desmacidonidæ (*Esperella*, &c.), and in the Axinellidæ (*Axinella fibrosa*), hand in hand with a corresponding reduction in the siliceous element. We thus know four distinct paths along which the Keratosa may have developed, and the group is thus shown to be probably of polyphyletic origin, and, consequently, unnatural.[1]

This fact probably accounts for the singular difficulty which Poléjaeff found in classifying the group, and appears to us to be a much more probable explanation of this difficulty than the assumption, for we can call it little else, that "*the whole group is nothing more than a simple family.*"[2] This method of cutting the Gordian knot, simple as it is, is hardly satisfactory.

Having come to the conclusion that the Monaxonida do not constitute a very natural order, although the two suborders therein included are probably natural enough, we ought perhaps to attempt some justification of our conduct in retaining the name at all. The real fault lay in the original distribution of the Challenger collections, and this could not be avoided, for it is only since this distribution was made, and since two of the Reports on Sponges have been published, while others have been far advanced, that the great mass of facts necessitating the recent modifications in classification has been brought to light. At one time it was believed that the Monaxonida were a natural group, and by the time that the error was discovered the work was so far advanced that it was impossible to effect a redistribution. Hence we were left with two suborders, the Halichondrina and the Clavulina, and for these we have been forced to retain the name

[1] Marshall's Phoriospongiæ, which have given rise to so much discussion, are to be similarly explained as having originated polyphyletically from the Halichondrina. Marshall gives the following diagnosis of the genus:—"Kieselschwämme mit schlanken, einfachen Nadeln mit einer Spitze, Stecknadeln und Doppelhaken durchziehen und umspinnen Sandmassen, sie zu Klumpen vereinigend; das Ganze ist mit einer abziehbaren Haut bedeckt" (*Zeitschr. f. wiss. Zool.*, Bd. xxxv. pp. 122–126). The view proposed by him that they are siliceous sponges which penetrate and unite together masses of sand appears to us hardly to bear investigation; the fact that the whole mass is enclosed in a definite, pore-bearing, dermal membrane, as Marshall himself describes, is opposed to this idea. Von Lendenfeld (*Proc. Linn. Soc. N.S.W.*, vol. x. p. 81) advocates a very different hypothesis; he says "I do not hesitate to consider the Phoriospongiæ as belonging to the horny sponge as well as those Porifera which, like Dysidea, possess an arenaceous skeleton but no flesh-spicules. . . . . I consider the Phoriospongiæ not as boring sponges living in sand; but as Ceraospongiæ belonging to the group with arenaceous irregular fibres," and again (p. 84)—"I believe that the flesh-spicules in the Phoriospongiæ and horny sponges on the one hand, and those of the silicifibred sponges on the other have been produced independently of each other." It seems to us that von Lendenfeld also has here placed a wrong interpretation upon the facts before him. It is quite unnecessary to assign such a polyphyletic origin to the microsclera ("flesh-spicules") in question, and we regard the Phoriospongiæ not as forming a separate genus at all, but as derived from several distinct genera of Monaxonida, in which, probably owing to the influence of similar external conditions, the proper siliceous skeleton has been replaced to a greater or less extent by sand and other foreign bodies. The fact that when proper megasclera occur in these sand sponges they are small and slender, and to all appearance degraded forms, argues in favour of our view. It is well known that sponges have a strong tendency to take in foreign bodies of all kinds with which to build up a skeleton. In the horny sponges (*e.g.*, *Euspongia*, *Dysidea*) this very frequently occurs, and also in the Heterorrhaphidæ (*Tedania commixta*, nobis), the Desmacidonidæ (*Esperella parasitica*, Carter, *Esperella arenicola*, nobis, *Iophon omnivorus*, nobis), the Suberitidæ (*Polymastia agglutinans*, nobis), and the Spirastrellidæ (*Spirastrella solida*, nobis). In some cases these sand sponges have sufficient spicules remaining to enable us to say from what genus they have been derived, while in other cases this is no longer possible.

[2] Zool. Chall. Exp., part xxxi., Report on the Keratosa, p. 81.