

Barrois's Embryologie de quelques Éponges de la Manche and from Vosmaer's paper on *Leucandra aspera*, proved that, contrary to Haeckel's assertions, the Leucones seem to be more closely allied to the Sycones than to the Ascones. But all these statements, valuable and important as they were from a morphological point of view, could not serve as a basis for a new arrangement of the group. They rendered every one still more conscious of the fact that Haeckel's system is quite artificial, but they were too fragmentary for any systematic deductions. In order to construct for the group in question a new systematic edifice, not merely the study of a single species but the revision of a whole collection was indispensable, together with the simultaneous examination of certain original forms examined and described by Haeckel. Such a collection had been made during the voyage of H.M.S. Challenger, and, further, thanks to the kindness of many naturalists, the author of the Report was enabled to obtain, for the purpose of comparison, most of the original Calcarea of interest and importance. The main results of the Report conducted under these very favourable circumstances are the following:—

“The group of Calcarea is not to be subdivided directly into families as proposed by Haeckel, but primarily into two orders, namely (1) Homocœla, represented by the single family Asconidæ, and characterised by a complete absence of differentiated flagellated chambers, the whole central cavity being covered with a continuous layer of flagellated cells; and (2) Heterocœla, embracing the families Syconidæ, Leuconidæ, and Teichonidæ, characterised by the fact that their central cavity, together with its derivatives, are coated partly with pavement epithelium (inhalent and exhalent canal system), partly with flagellated epithelium (flagellated chambers).

“The above deduction is perhaps the most important in the Memoir, and therefore the communication here of the facts and arguments on which it is founded may not be superfluous.

“The striking resemblance of the Asconidæ to the phase of development of Calcarea known under the name of Olynthus was remarked long ago, and Haeckel as well as Vosmaer take the Olynthus in their phylogenetic speculations for the starting point, identifying it with the primitive Ascon representing the stock of the whole group of Calcarea. The deductions of Haeckel having been rejected by Vosmaer, those of Vosmaer—and particularly his flagellated epithelium theory—are now in their turn rejected by Dr. Poléjaeff, who does not identify the Ascon with the Olynthus, this latter being, according to him, ‘a neutral being, and the Ascon one of its modifications, the Sycon another.’ He states that ‘an Olynthus may increase longitudinally without lateral growth, and in that case it will give origin to an Ascon.’ ‘An Olynthus,’ he further suggests, ‘may also grow in all directions in length as well as laterally,’ and on the ground of certain, so to speak, geometric arguments in connexion with others concerning the question as to what histological elements do in the Calcarea take in the nutritious