

however, an upper group. This latter statement demands an explanation. The fact is that Carter does not follow the, so to speak, "dendroid" principle of classifying Porifera recommended by Gray; he does not adopt his subdivision of Porifera into two chief groups, that of Calcarea and that of Silicea,¹ but subdivides the whole type or subtype of Porifera into eight equivalent groups (orders), leaving the reader entirely uncertain how the mutual affinities of these eight orders are to be graphically expressed,—whether by eight radial branches from the same spot, or by one chief branch with secondary, tertiary, &c., ramifications. I lay great stress upon this. Our present aims are not only of purely systematic, but also of phylogenetic, character, and the more the most experienced spongiologist of our day, Mr. Carter, has the right to express his opinions on the question, the more one must feel disappointed to find in his system an arrangement which, neglecting the usual laws of the systematic, and yet not accompanied with an explanatory genealogical tree, leaves the reader in the mist of uncertainty as to whether its author regards, *e.g.*, the Calcarea as forming a group systematically equivalent to that, for instance, of Psammonemata, the Ceratina equivalent to the Hexactinellida, &c., or not. Apart from these more general questions, the opinions of Mr. Carter as to the affinities of horny sponges are clear; in harmony with Gray and Bowerbank he composes his third family of Psammonemata (Pseudohircinida) of groups devoid of proper spicules and again of groups provided with them. The opinions of different spongiologists as to the question I am now discussing are thus very contradictory and even conflicting, but although most of them are expressed in very decided language, it would yet be a hopeless task to search into their papers for any grounds in favour of suggestions upheld by them; these grounds are shrouded in darkness. Moreover, the decided language just alluded to is often at variance with other suggestions of the same author. Thus, for instance, with respect to O. Schmidt. On page 36 of his work on the sponges of Algeria he lays stress on his Ceraospongiæ and Chalineæ being quite natural and independent families; on the following page of the same work he says that he feels certain that "gewisse Gattungen einer Chalineæ zu nennenden Familie unter sich weit weniger als mit bestimmten Gattungen der Ceraospongiæ, direct verwandt sind." Under such circumstances there remains no other way of elucidating the matter but to turn to

¹ Dr. Vosmaer (Report on the Sponges dredged by the "Willem Barents," p. 3), agreeing with this proceeding, but not content with the designation of Silicea, since it embraces forms like true Keratosa or Myxospongiæ, *i.e.*, forms devoid of any siliceous spicules, proposes for it the name of "Non-calcarea." I believe this to be scarcely an amelioration. There are indeed cases when negative designations are very fortunate. On the whole, however, they are not to be recommended, and certainly not with respect to the Non-calcarea of Vosmaer. The name of, *e.g.*, *Acrania*, Haeckel, being negative, includes nevertheless a systematically important positive allusion. That of Non-calcarea is devoid of it. I agree that it is illogical to call Silicea *inter alia* sponges without any siliceous spicules, but though illogical this designation is in possession of a phylogenetic sense. As the reader will see later, there can be no doubt as to the fact that Keratosa, like Myxospongiæ (these latter perhaps not directly, but this does not alter the case), owe their origin to siliceous sponges, and from this point of view there can be no objection to the grouping of all these closely allied sponges under the general name "Silicea"—as nobody finds it strange that the order of Diptera includes forms like *Pulex irritans* or the type of Arthropoda animals like *Rhizocephala* or *Tardigrada*.