I.—MORPHOLOGICAL OBSERVATIONS.

In the class of Calcarea, Prof. Hæckel distinguishes three families—Ascones, Sycones, and Leucones, characterising them according to the properties of their canal system. In each family he establishes seven genera, taking the character of the spicules (whether triradiate, quadriradiate, or acerate) as the generic character, seven combinations being thus possible. The form of the spicules is reserved for the establishment of specific characters. The classification constructed upon these principles Prof. Hæckel calls "natural,"[1] and puts it in opposition to his former classification published in the year 1869.[2] It cannot be denied that in comparison with the system of the Prodromus, the arrangement proposed in the Monograph is a great advance; the arrangement of the Monograph, although still rather artificial, is incomparably more natural than that of the Prodromus, and shows that its author had made great progress in the recognition of the organisation of the calcareous sponges. There is, however, a great difference between a *more* natural and a *really* natural system. A natural system is the last link of a long chain of investigations, it is the crown of all former studies, it becomes possible only when the majority of the representatives of a group of animals has been examined and described. The very fact that of the thirty species brought home by the Challenger Expedition, twenty-three present quite new forms, proves clearly how few Calcarea we know, and how very many forms are still to be discovered. And therefore, till the right time comes for making a summary of our knowledge, nothing but attempts at a natural arrangement can be given. The system of Prof. Hæckel is no essay. Having founded his genera upon all the possible combinations of the three kinds of spicules, he thereby restricted the number of genera for ever, and, even though he had been thoroughly justified in this by the forms he had for examination, he would still have been premature in classifying the Calcarea in the manner he did. But it is sufficient to peruse the Monograph attentively in order to find that the justification just mentioned did not exist. For instance, characterising one species of Leucones—*Leucetta corticata*—Prof. Hæckel writes as follows:—"*Leucetta corticata* is one of the most peculiar Leucones, and possesses a near ally only in *Leucaltis clathria*."[3] The same, *mutatis mutandis*, is said

[1] Kalkschwämme, Bd. i. p. 79.
[2] Prodromus eines Systems der Kalkschwämme, *Jenaische Zeitschr.*, Bd. v. pp. 236–254, 1870.
[3] Kalkschwämme, Bd. ii. p 130.