

quantity of them is, however, still to be found. Are these spicules to be regarded as physiologically functional, however it may be? Can we assume that a single row of siliceous spicules render the horny fibres of *Chalina limbata* more hard? Can we ascribe to them any other than phylogenetic significance? Of course not; and, on the other hand, it is also plain that a sudden apparition of spicules in the horny fibres previously devoid of them is thoroughly inexplicable. On the contrary, the substitution of a horny skeleton for a skeleton represented by siliceous spicules is very simply imaginable. In numerous Silicea we have to deal with forms whose siliceous supporting apparatus forms throughout a network in the proper sense of the word. In many other Silicea we meet with forms whose skeleton is represented by spicules lying exclusively isolated; there are again amongst them forms whose skeleton is constituted by spicules aggregated in rows. That a skeleton represented by a compact network is of a firmer build than a skeleton represented by spicules lying isolated is evident. From this point of view it becomes clear that had a sponge once received the faculty of cementing the rows of its spicules with any connecting substance, this acquirement would have proved to be of a great profit to it. It is also equally plain that if the cementing substance proved to be equally hard and steadfast, and at the same time more elastic than the siliceous spicules, it might, in the course of time, have forced away these latter entirely. I hope this theory gives a very simple explanation of the phenomenon. It is also in harmony with the facts concerning the structure of the soft parts of Keratose sponges, and, on the other hand, of Chalinidæ, Renieridæ, &c. Of course the literature of the question is very poor; some remarks of Dr. Vosmaer¹ on the structure of the Renieridæ, as well as a couple of observations on the anatomy of the Chalinidæ by Dr. Keller;² the observation of this naturalist³ on the structure of *Reniera semitubulosa* executed under the influence of Prof. Haeckel's statements on the non-existing racemose type of the canal-system being unreliable; they are, however, quite sufficient for our purposes, and with regard to the Renieridæ I can also make use of my own investigations. As to the Chalinidæ, the drawing by which Dr. Keller illustrates the internal organisation of his *Chalinula fertilis* (*loc. cit.*, pl. xviii. fig. 1) cannot be misinterpreted; the ground-mass being devoid of any granules, and the flagellated chambers of special cameral canaliculi, it is clear that we have here to deal with the type of the canal-system characteristic of Spongelidæ, and the size of the flagellated chambers being, according to Keller (*loc. cit.*, p. 327), 0·02 mm. on an average, and their shape round, with that special modification which distinguishes my genus *Psammoclema*. As to the internal structure of Renieridæ, I differ somewhat from Dr. Vosmaer. Indeed, his remarks are extremely short. He states, however, that their anatomical organisation recalls vividly that of *Euplectella aspergillum*, as

¹ Voorloopig berigt omtrent h. onderzoek aan de Nederl. werktafel in h. Zoöl. Stat. te Napels, Haag (?), 1881.

² *Zeitschr. f. wiss. Zool.*, Bd. xxxiii. p. 326.

³ *Ibid.*, Bd. xxx. p. 579.