

such closely similar forms, and actually place them in separate Orders with all the Oculinidæ, Astræidæ, and Eupsammidæ between them. I have no doubt that the soft structures in the two genera will, when examined, be found to be closely similar. If the Rugosa are to be maintained as a separate Order, it must be retained to include only Palæozoic forms, which differ in more important particulars. It may be that recent forms, such as *Duncania*, form a stepping-stone to the Rugose corals generally; of their close affinity with some of them there can be no doubt, when such eminent authorities as Duncan and Pourtalès agree upon the matter; but either those corals at present placed amongst the Rugosa with which they are allied must be separated from the old Order, or the Order itself must be given up as such. There can be little doubt that a system of classification which places a separation of ordinal importance between the genera *Thecocyathus* and *Duncania* must be in the highest degree unnatural. I have had no opportunity as yet of studying the structure of Palæozoic corals myself, and therefore wish to write with all due deference on the matter. Professor Martin Duncan, has expressed somewhat similar views to me on the question.

In examining specimens of *Rhizotrochus typus* in the British Museum, I was struck by the close similarity in structure displayed by its exothecal roots to those of *Duncania*. They are of the same texture on the surface, and are striated in a similar manner. Inside the calicle several thin narrow plates of hard tissue are developed running all round the calicle just within its mouth, and parallel to its wall. These seem to represent the stereoplasma. Moreover, the septa are extremely irregular, and in neither young nor older specimens is an arrangement of the septa in sixes well marked. In the oldest and largest specimen sixteen septa are thicker than the rest, and are prominent near the centre of the calicle and, so to speak, "primary." The frequent arrangement of the septa in sixteens in *Caryophyllia communis* will be found noted under the description of that species. The genus *Neohelia* described in the sequel is remarkable for having its septa arranged with perfect regularity in fives, a condition which occurs also in some forms of *Madracis*.

With regard to the distribution of the deep-sea Madreporaria, it appears that, as in the case of other deep-sea animals, they are mostly very widely distributed, indeed some, as for example *Bathyactis symmetrica*, have a world-wide range. Examples of the genus *Flabellum* appear to be rather scarce off the north-east American coast and the West Indies, and no *Flabellum* was described in Pourtalès' first list of deep-sea corals from those localities; but *Flabellum angulare* was dredged by the "Blake," and a new species of *Flabellum* was obtained by Mr A. Agassiz on his late expedition. Moreover, Mr Verrill has described another species *Flabellum goodii*, as dredged in 220 fathoms on the eastern slope of Georges Bank. At present the only genera which seem to be restricted in range are *Stephanophyllia* and *Sphenotrochus*, which have as yet been obtained only from the seas of the Malay Archipelago in comparatively shallow water,