

## INTRODUCTORY REMARKS.

The number of Corals dredged by H.M.S. Challenger in deep water was comparatively few, having regard to the very large number of stations (354) at which dredging operations were conducted. No doubt this result was largely due to the fact that during all but the earlier portion of the voyage, a trawl-net with a somewhat wide mesh was made use of instead of a dredge, as yielding the best general results. The trawl made use of was an ordinary fisherman's trawl-net, with none of the improvements which Mr Alexander Agassiz has since introduced and employed with such great success in his dredgings from the United States' Coast Survey steamer "Blake."<sup>1</sup>

Of a great many species only a single specimen or two or three were obtained by the Challenger, but specimens of very many of these rare forms, most of which were hitherto unknown, have been since dredged by Mr Agassiz, as I am informed in a letter recently received from Count Pourtalès.

I have found considerable difficulty in assigning many of the forms obtained to species new or old. The specimens dredged were always dead when they reached the surface, and the soft parts were often more or less decomposed or battered, having suffered during the long period consumed in raising them to the surface. With the structure of the corallum only to judge by, it is very often extremely difficult, often impossible, to determine the exact affinities and relations of many forms, and in not a few instances the question at issue not only refers to the nature of the genus to which certain corals shall be referred, but even to which family a specimen shall be relegated. No naturalist who has worked at the determination of the species of corals has doubted that the classification of MM. Milne-Edwards and Haime is faulty in very many respects, and needs thorough revision. Such revision will only be possible when the anatomy of the soft parts of very many forms has been carefully worked out. Unfortunately, there are no other animals in which the technical difficulties in the investigation of the anatomy are so difficult, or in which they require so long a time for their accomplishment as in the Madreporaria. I have been able to make very few investigations of this nature, though I hope to work at the subject at leisure at some future time. The results of a few observations which I have made in the case of two or three species are given in the present memoir in connection with the descriptions of the species to which they apply.

I have placed Pourtalès' *Parasmilia variegata*, of which specimens were obtained by the Challenger, under the genus *Caryophyllia*. I cannot think that the Trochosmilidæ have any real affinity with the Astræidæ, or that the occasional presence in them of dissepiments within the interseptal chambers is of any classificatory importance. Pourtalès has found dissepiments as well developed in some undoubted *Caryophylliæ*. I believe that

<sup>1</sup> Bull. Mus. Comp. Zool., Harvard, No. 14, 1879, p. 292.