

To take another instance, this time from the Mesozoic rocks. The Inferior Oolite of the south of England is admittedly a shallow-water deposit. Species of *Littorina* occur in it; Oysters, Pectens, and Astartes are common, and if we are logically precluded from advertent to palæontological evidence in conducting this argument, then we may refer to the false bedding, sudden variations in the nature of the deposits, and the "thick beds of sand which are locally interposed at various horizons." Mr. Whidborne,¹ from whom I quote the last sentence, considers that "the Inferior Oolite deposits were formed at an irregularly varying level, but in shallow water." Yet from this deposit at Burton Bradstock four species of Hexactinellida belonging to four genera were obtained by Mr. Whidborne, together with one species of Lithistid and one of a calcareous sponge. The single Lithistid (*Platychonia*, a genus much resembling *Azorica*) might very well occur without indicating any change in the existing bathymetrical distribution of the Lithistida, but the four species of Hexactinellids can scarcely be regarded as stragglers out of deep water.

In the Chalk the great development of Hexactinellids has been supposed to be an argument in favour of its deposition at great depths. To my mind it has always seemed that the apparently deep-sea character of the chalk was rather an argument in favour of the deep-sea character of the Sponges, but as there is no real necessity for supposing the chalk to have been anything more than a clear-sea deposit, this argument is not by itself of much value. A clear continental sea would be produced by a comparatively inconsiderable depression of the greater part of Europe and Asia, and the mountains which would still remain above the sea level would have only a very local effect in rendering it turbid; in such a sea Globigerina ooze might readily be produced, and the Cretaceous fauna with it. This is only a supposition, but that view which regards the chalk as a deep-sea deposit is nothing more.

That the bathymetrical distribution of the Hexactinellids has not always been the same as at present is I think evident, and we have no reason to suppose that that of other groups has been more constant.

On the other hand, I cannot find any suggestion of evidence in favour of Vosmaer's hypothesis that the ancestral sponges were deep-water forms; whatever evidence we have points distinctly in the opposite direction, and to this we should be led by *à priori* considerations; for the fertile source of marine forms of life is to be found in the littoral zone of algal vegetation, and it is probably here, where food and light and oxygen are most abundant, that most of the great groups of marine animals had their birth-place, but it is here also that competition is most severe, and to forms that cannot maintain their hold upon this marine Canaan, the deep-sea offers a convenient refuge.² If this be

¹ *Quart. Journ. Geol. Soc. Lond.*, vol. xxxix. p. 487, 1883.

² This opinion has been expressed by Professor Moseley, who says:—"With regard to the origin of the deep-sea fauna, there can be little doubt that it has been derived almost entirely from the littoral fauna."—Presidential address to Section D, British Association Report, 1884, p. 752.