

LX.—*Reports on Dredging*. By J. GWYN JEFFREYS, F.R.S.

I HAVE not much to say in answer to the remarks made by Mr. M'Andrew in the last Number of the 'Annals,' because it seems to me that we do not differ in any very material point.

With regard to "bathymetrical" zones (in which, of course, I did not mean to include that part of the shore which lies "beyond the reach of ordinary tides"), I am satisfied with my friend's admission that "the same species often frequent different depths in different seas:" from my own experience in dredging (now of between thirty and forty years), I would say the *same* seas. I am not a disbeliever in zones, having, in my work on 'British Conchology,' adopted and endeavoured to define four,—viz. littoral, laminarian, coralline, and deep-sea; but the first two and last two of these constitute two principal zones, which may be termed littoral and submarine. Some species of Mollusca, as well as of other animals, range from low-water mark to the greatest depth reached by the dredge.

The question as to the comparative size of northern and southern specimens of the same species was so fully discussed by us in the 'Annals' for 1860, that it is unnecessary to continue the controversy. I would, however, observe that perhaps our disagreement on this point may in some measure arise from my considering certain forms mere varieties which other conchologists hold to be distinct species. I have elsewhere given my reasons for uniting *Pecten septemradiatus* with *P. clavatus*, *Lima hians* with *L. tenera*, and *Astarte sulcata* with *A. elliptica* and *A. fusca* or *incrassata*. The last named in each case I regard as the southern form, and the others as the northern form of those three species. Mr. M'Andrew did not find *Pecten septemradiatus* on the Scandinavian coast so large as those of Loch Fyne. A valve from the Faroe banks, dredged by Dr. Carpenter and Professor Wyville Thomson, measures an inch and nine-tenths in length; this far exceeds any I have seen from Loch Fyne, where the species is common. He also says that his specimens of *Astarte sulcata* from Gibraltar and from Finmark are equal in size; and he agrees with me that size diminishes with depth. His dredging-lists record that species from 45 fathoms at Gibraltar and 15–160 fathoms on the western coast of Norway. Possibly his Finmark specimens came from the deepest water, and were consequently smaller than those from Gibraltar. But even if it were not so, my proposition was qualified; and every rule has its exception.



The colour of shells in their living state is, I believe, more affected by temperature than by light; and the former of these conditions must also have a considerable influence on the quantity as well as on the variety of animal life. The cases I instanced of bright hues from deep water were by no means exceptional, and might be supplemented by many more. Indeed, while I am writing, there are on an adjoining table specimens of *Venus ovata* (the shell referred to by Mr. M'Andrew), lately procured by Carpenter and Thomson in the North Sea at depths of 189 and 550 fathoms, the colour of which is, as usual, reddish-brown, some specimens being variegated—also, from 189 fathoms, a bright-red *Tectura fulva* and a pink-rayed *Tellina pusilla*. Milne-Edwards noticed, in the case of the Mediterranean electric-telegraph cable, *Pecten opercularis*, var. *Audouinii*, as “*fortement colorée*” from between 1010 and 1530 fathoms; and Sars, in his further remarks on the distribution of animal life in the depths of the sea, has now recorded the occurrence of *Pecten septemradiatus*, *Astarte sulcata*, *Natica Montacuti*, and *Eulima bilineata* from 250–300 fathoms, having the same coloured markings as in specimens from shallow water. We do not know the extent to which sea-water is penetrated by the sun's rays; but as cephaloporous mollusks which live at considerable depths are provided with eyes, it may fairly be assumed that light exists there. Carpenter and Thomson got several specimens of *Pleurotoma carinata* in 189 fathoms, and one of *Columbella haliæti* in 530 fathoms: all these were living, and had conspicuous eyes. In a letter just received from Professor Lovén, he says that, in the last Spitzbergen Expedition, “not a few forms” were brought up from over 2000 fathoms. When the collections have been examined, we shall know something more on this interesting subject.

My proposition founded on the casual occurrence in our seas of exotic and oceanic shells had no reference to the distribution of the Mollusca.

The important explorations of Carpenter and Thomson (which it is hoped will be renewed next year) have produced another addition to the list of recent species which had been called “extinct.” A specimen of *Pleurotoma galerita* was dredged about fifty miles from Cape Wrath, at a depth of 189 fathoms. Philippi described and figured this species as a very rare Calabrian fossil.