

four species just enumerated, and comparing them with their shallow-water allies, we cannot fail to be struck with one very remarkable fact, and this is that while the shallow water species are characteristically more or less amorphous in external form, or, at the most, simply digitate or ramose, those from below the thousand fathom line have, almost without exception, beautifully symmetrical and definite shapes. This interesting circumstance is probably to be accounted for by the fact that the deep-sea forms are exposed to precisely similar external conditions for very long periods of time, and variations in any one particular direction (which prove to be advantageous to the species under its particular external conditions) have time to develop into fixed and definite characters; while in the shallow-water forms the ever changing external conditions necessitate corresponding changes in the sponge, and no external forms can become fixed and permanent, excepting such as, from their very general and unpronounced character, are suited to the ever varying conditions under which they are placed.

We have already had occasion to show, in discussing the value of external form as a guide to classification, that it is of all characters perhaps the most variable and, consequently, the least trustworthy. The particular external form which a deep-sea sponge assumes may not infrequently be explained by reference to the conditions under which it lives, and in this fact lies strong confirmation of the views to which we have just given expression.

Thus in *Tedania actiniiformis*, a sponge whose shallow-water congeners are characteristically shapeless, the peculiar external appearance (Pl. XI. fig. 2), and chiefly the arrangement of the pores and oscula, are explained by the fact that the sponge lives on a bottom of mud in which it is nearly buried.

Many of the most remarkable external forms which we know are due to the necessity of obtaining some means of support to prevent the sponge from sinking bodily into the soft mud or ooze which is so prevalent at great depths. Thus we can easily account for the "Crinorhiza" forms already discussed,<sup>1</sup> and for the analogous "Trichostemma" forms.<sup>2</sup> Nor need we be surprised that species of distinct (though allied) genera (e.g., *Cladorhiza*, *Axoniderma*, and *Chondrocladia*), all living under precisely similar conditions, arrive at a precisely similar solution of this difficult problem of support, viz., the "Crinorhiza" form.

Other perfectly definite and characteristic external forms found in deep-sea sponges are, however, as yet unaccounted for. Amongst these we may mention those of *Stylocordyla* and *Tentorium*; but by far the most extraordinary and beautiful is that exhibited by *Esperiopsis challengerii* (Pl. XVIII.) which has been fully described elsewhere,<sup>3</sup> and which comes from a depth of 825 fathoms (hence it is not included in the foregoing list, which contains only species from a depth of over 1000 fathoms, though of course a deep-sea form).

<sup>1</sup> *Vide* p. 87.

<sup>2</sup> *Vide* p. 216 *et seq.*

<sup>3</sup> *Vide* p. 80.