

bottom of red mud (Pl. XVI. fig. 1). The cirri, though short, are very closely set, and those of the five lowest whorls bend downwards underneath the last nodal joint and interlace with one another so as to form a kind of basket-work just like that beneath the centro-dorsal of a *Comatula* with many cirri, such as *Antedon eschrichti*. This led Sir Wyville Thomson¹ to remark that "from the attitude of the cirri and from the appearance of the end of the stem there can be no doubt that this specimen is complete, that it is mature, and that it was living in an unattached condition." I do not well see how this statement can be disputed. Neither do I understand the difficulty of admitting that the mode of life of a *Pentacrinus* may vary in different localities. The *Comatulæ* are fixed when young, and semi-free when mature, attaching themselves by their cirri to various objects; but some species (*Actinometra jukesi* and *Actinometra stellata*, &c.) eventually lose their cirri altogether, and must then live an absolutely free life. The Palæozoic *Agassizocrinus* and *Edriocrinus* were attached when young, but subsequently became perfectly free. Considering that these great changes take place during the life of a single individual, I fail to see the difficulty of admitting that a particular species of *Pentacrinus* can adapt itself to the conditions of its existence, some young individuals fixing themselves permanently when they have the opportunity; while others living on soft ooze in deeper water separate themselves from their original anchorage and lead a partially free existence, being only attached temporarily, just as a *Comatula* is. A precisely similar case to that of *Pentacrinus wyville-thomsoni* is presented by *Pentacrinus decorus*. Some individuals are firmly fixed to telegraph cables by the spreading base of their stem, while others have been found in the semi-free condition.

Circumstances alter cases; and the question of the natural freedom of the individual represented in Pl. XIX. fig. 1, which has five perfect cirri on a rounded nodal joint at the base of the stem, is by no means negatived, because the "Talisman" found several others attached by calcareous growths round the cirri of the lowest whorl. The French zoologists, however, appear to consider that this observation proves Sir Wyville to have been wrong; whereas, on the contrary, the dredgings of the Challenger and the "Blake" have confirmed his views in the most satisfactory manner.²

Except at the lowest nodal joint the cirri of *Pentacrinus wyville-thomsoni* appear to be usually directed upwards (Pl. XVIII. figs. 1, 3; Pl. XIX. fig. 1); and the supra-nodal joint is accordingly slightly grooved for the reception of the cirrus-bases (Pl. XIX. figs. 3, 4; Pl. XXII. fig. 17) instead of the infra-nodal joint as is so markedly the case in *Pentacrinus blakei* and *Pentacrinus decorus* (Pl. XXXI. figs. 1, 3; Pl. XXXIV. fig. 1; Pl. XXXVI.), in which the cirri are usually directed downwards. In this respect, therefore, *Pentacrinus wyville-thomsoni* presents an approach to the genus *Metacrinus*, in

¹ The Atlantic, vol. ii. p. 126.

² Much of what has been written above would have appeared more suitably in Chapter II. pp. 18-22, where the mode of life of the Pentacrinidæ is discussed. But as Filhol's article did not appear till after this chapter had gone to the printers, and did not come under my notice till five months later, I have been obliged to take up the subject again.