

condition as it occurs in *Pentacrinus wyville-thomsoni*. "All the stems of mature examples of this species end inferiorly in a nodal joint surrounded by its whorl of cirri, which curve downwards into a kind of grappling root. The lower surface of the terminal joint is in all smoothed and rounded, evidently by absorption, showing that the animal had for long been free. I have no doubt whatever that this character is constant in the present species, and that the animal lives loosely rooted in the soft mud, and can change its place at pleasure by swimming with its pinnated arms; that it is, in fact, intermediate in this respect between the free genus *Antedon* and the permanently fixed Crinoids."

Many other species of *Pentacrinus* and some of *Metacrinus* exhibit the same condition. It is best seen in *Pentacrinus wyville-thomsoni*, in which the nodal joint sometimes loses its ordinary characters altogether, becoming much enlarged and rounded below so as to be almost hemispherical in appearance (Pl. XXII. fig. 27).¹ In other cases, however, it retains its petaloid form and more or less of the small amount of sculpture which is usually found upon its lower face; and a small rounded tubercle appears in the centre of the latter closing up the opening of its central canal. This is the usual condition of other species of *Pentacrinus* (e.g., *Pentacrinus asteria*, Pl. XI.) and of *Metacrinus*; and the analogy between it and the condition of a young *Comatula* just detached from its stem is very striking, as was pointed out by Sir Wyville Thomson.² In both cases the severance takes place between a nodal joint and the top joint of the internode below it.

The relations of the two longest stems that I have met with in this condition are shown as follows:—

Pentacrinus decorus, stem 48 cm. long, rounded off at the thirtieth node.

Metacrinus angulatus, stem 38·5 cm. long, rounded off at the thirty-fifth node.

With one exception (*Pentacrinus maclearanus*, Pl. XVI.) the three shortest of these semi-free stems that I have examined all belong to *Pentacrinus alternicirrus*. A, 47 mm. long, ends at the eleventh node; B, 49 mm., ends at the eleventh node; and C, 55 mm., ends at the twelfth node. On the other hand, the smallest number of nodes in a semi-free stem occurs in *Pentacrinus wyville-thomsoni*; one individual having a stem 90 mm. long, which

¹ The unusual enlargement of the lowest nodal joint in this individual suggests the idea that the structures which have been described by Hall under the name of *Ancyrocrinus* (Fifteenth Annual Report, New York State Cabinet of Natural History, 1862, pp. 89, 90) may be the detached stems of a Palæocrinoid in the semi-free condition. According to Hall they "have the form of a bulb or thickened column, with lateral ascending processes and a central ascending column of greater or less length;" and he suggests that they "indicate the existence of a free floating Crinoid with the thickened bulb below serving as a balance for the column and body above. The articulating scar on the lower extremity of the smaller ones indicates that the animal was fixed in its young state." The four lateral spine-like processes may very well have been cirri, the jointed structure of which has become obliterated by a calcareous overgrowth, just as in the lower part of the tetramerous stem.

² Sea Lilies, p 10.