

case of the lowest whorls this may be due to the cirri having been soldered to the bottom by calcareous expansions, I have never seen any traces of such a condition.

In the first place, there is a stem-fragment of *Pentacrinus asterius*, consisting of a few internodal joints with a nodal joint beneath them which is somewhat worn and has its central canal closed up by a low rounded tubercle; so that it must have been detached for some time from the infra-nodal joint which completed the syzygy. But all the cirri borne by this modified nodal joint are perfect throughout their whole length, nearly 70 mm., and were most certainly not soldered to the bottom at the time the animal was captured.

Then again, in a fine *Pentacrinus mülleri* from Martinique with a stem 120 mm. long, which is closed below at the thirteenth node, all the cirri of this node are perfect from the base to the terminal claw. They reach 50 mm. in length, and are spread out in different directions, two being curved sharply upwards, while the others are more or less horizontal. Their general appearance is very similar to that of the long cirri of *Antedon phalangium*. But not one of them shows any trace of having been soldered to the bottom. The cirri of the next four whorls above are all long enough to have touched the bottom had the animal been attached like the individuals of *Pentacrinus wyville-thomsoni* dredged by the "Talisman." Eight of these twenty cirri, four in the first whorl, two in the next, and two in the highest one, are now more or less broken; but this is clearly due to accident, and not to the fracture of an attachment. The same may be said of a specimen of *Pentacrinus mülleri* in the Natural History Museum, which has a stem 135 mm. long, with several of the lower cirri remaining unbroken; while the under surface of the twelfth nodal joint at which the stem ends is worn and somewhat rounded, and bears two or three attached Foraminifera. The animal cannot, therefore, have been attached by the base of the stem, though the cirri may have been soldered to the bottom; but their appearance is against this supposition.

The same remarks apply to *Pentacrinus alternicirrus*, in which the cirri reach 50 mm. in length. Those of the four or five lowest whorls turn more or less directly downwards, and all reach below the level of the terminal nodal joint, which may be anywhere between 47 and 155 mm. from the calyx. But none of these cirri in any of the twelve individuals which I have examined show any signs of having been soldered to the bottom. Many of them are now broken; but others are quite perfect, though they must have been in contact with the bottom, had the animals been permanently anchored like the "Talisman" examples of *Pentacrinus wyville-thomsoni*. The single *Pentacrinus* dredged by the Challenger on hard ground belonged to this species; and as all the cirri of the lowest whorls are more or less broken, it is quite possible that they may have been torn away from a permanent attachment to the bottom. Another conclusive argument against the general application of the "Talisman" observations is afforded by the condition of the single specimen of *Pentacrinus maclearanus* which was dredged by the Challenger from a