

while in *Periechocrinus* the vault is composed "of small irregularly arranged smooth pieces, among which the apical dome plates are indistinctly represented."¹

All these genera, therefore, resemble *Strotocrinus*, and from the evidence of that genus we are entitled to believe that the apical dome plates would be relatively more prominent at earlier stages of development. Now this is exactly the case with the orals of recent Crinoids, which at first surround the whole of the upper surface of the larval body; but eventually may be altogether resorbed or gradually reduced in comparison with their fellows, the basals, as in *Rhizocrinus* (Pl. X. figs. 2, 3, 7).

Thus then I believe the oral or actinal system forming the vault of *Actinocrinus* to have been developed on the left larval antimer, in exactly the same way as the apical or abactinal system is developed on the right; but the oral system, instead of being limited to five oral plates as in Neocrinoids, reached a very extensive development, so that in its completest form it presents such a parallel to the apical or abactinal system as is to be met with in no other Crinoid, much less in any other Echinoderm.

The greater variability in the development of the proximal plates, and their occasional separation by smaller intercalated pieces, resembles the extreme irregularity of the apical system of an Ophiurid, as compared with that of a Crinoid or Urchin.² The interradiial plates of the former (or basals) have important relations to the chambered organ. Those of the Urchin (genitals) are often connected with the genital ducts; and the radial plates in the same way have important functions in both groups. In the disk of an Ophiurid, however, neither interradiial nor radial plates are of any functional importance; and we find accordingly that their state of development differs very considerably even in allied species. Much the same is the case in the dome of the Actinocrinidæ, where the plates are not in any way specially related to internal organs, though serving to protect them.

Wachsmuth totally denies that there is any homology between the solid vault of a Palæocrinoid and the ventral or oral disk of a recent form. So far as the Actinocrinidæ are concerned, I entirely concur in this opinion, except as regards those Neocrinoids, such as *Hyocrinus*, *Thaumatocrinus*, and *Holopus*, which have persistent orals. For I believe that representatives of these plates exist in the vault of all Palæocrinoids, whether simple or complex, although they are sometimes very greatly reduced; and I cannot therefore agree with Zittel³ in considering them as entirely absent in the vault of Actinocrinidæ, Platycrinidæ, Melocrinidæ, Rhodocrinidæ, &c.

The Cyathocrinidæ and the Blastoids seem to resemble *Strotocrinus* and *Periechocrinus* in the small size and want of definite arrangement of the apical dome plates. Neither in Wachsmuth's famous specimen of *Cyathocrinus malvaceus*, nor in any of the Cyathocrinidæ figured in Angelin's Iconographia can any definite arrangement of the

¹ Revision, part ii. p. 131.

² Palæontologie, p. 331.

³ *Quart. Journ. Micr. Sci.*, 1884, vol. xxiv., N. S., pp. 4-14.