

accidental one, and that I am inclined to attach too much importance to it; and in that case I should certainly agree with Wachsmuth in calling them secondary interradials. One point, however, is worth notice. The orals of *Thaumatocrinus*, like those of *Hyocrinus* (Pl. VI. figs. 1-4; Pl. LVI. fig. 5), are only separated from the calyx plates by the thin band of perisome round the edge of the disk, which develops in the equatorial zone of the larva, concurrently with the increase in the diameter of the cup. These genera are thus in the condition of the advanced Pentacrinoid of *Antedon rosacea*, the oral circlet of which, owing to the increase in the size of the visceral mass, becomes detached from the summit of the primary radials; and the space between the two series is filled by the perisome of the equatorial zone, which separates the right and left larval antimers.

In the early stages of *Hyocrinus*, before this process had taken place, the orals would rest directly against the upper edges of the radials, as they do in *Holopus* (Pl. III. fig. 2), but in *Thaumatocrinus* they must rest against the primary interradial plates. They would thus be in precisely the same relative position as the "Scheitelstücke" of *Coccoerinus*; but I do not think that when a young *Thaumatocrinus* is found in this condition Wachsmuth will call the oral plates "secondary interradials"; though he uses this term for the plates of *Coccoerinus* which I, like Allman and Zittel, consider as representing the orals of Neocrinoids, including *Thaumatocrinus*.

If then the "Scheitelstücke" of *Coccoerinus* be oral plates, there are strong morphological reasons against the supposition that the ambulacra which pass in between them were closed by small marginal pieces, *i.e.*, by covering plates like those which occur so frequently on the arms and pinnules of many Neocrinoids (Pl. Vc. figs. 8-10; Pl. XIII. figs. 15, 16; Pl. XVII. figs. 2-4, 7-9) and Palæocrinoids, and on the summit of *Cyathocrinus*. Why should we invoke the existence of a "vault" over the orals of *Coccoerinus*, simply because it is a Palæocrinoid? There is nothing of the kind in the recent *Holopus* which dates back to the Chalk; while the allied genera *Cotylecrinus*, *Eudesicrinus*, and *Eugeniocrinus* are almost as old as the Mesozoic period. In no recent Crinoid, nor in the Pentacrinoid larvæ of those species which have covering plates to the ambulacra do these plates rest upon the edges of the orals. They commence at the margin of the peristome which is covered in by the orals, but there are none bordering the edges of the grooves between these plates.

It is partly, I believe, owing to his feeling the force of this objection that Mr. Wachsmuth prefers to consider the "Scheitelstücke" of *Coccoerinus* as secondary interradials, rather than as orals. When he has found a specimen showing the small pieces at their edges, I shall probably agree with him. But for the present I am inclined to lay more stress on the resemblance of the "Scheitelstücke" of *Coccoerinus* to the orals of Neocrinoids; although, according to Wachsmuth,¹ "this resemblance is probably merely

¹ Revision, part ii. p. 17.