

If, as Zittel supposes, the ambulacra of the arms were continued past the radial openings and up the steep sides of the oral pyramid, which is closed at the apex, how did they reach the peristome underneath? Did not food-grooves and the subjacent ambulacral structures pass in beneath the oral pyramid at the radial openings, so as to reach the mouth and the vascular and nervous rings around it, just as they must have done beneath the dome of *Actinocrinus*? It appears to me that *Haplocrinus* is permanently in the condition of a Pentacrinoid larva with a closed tentacular vestibule; though in other respects, such as the attachment of the brachial plates by muscles¹ and ligaments above a perforated articular ridge, it presents an advance upon that condition. There is an important feature in the structure of the oral pyramid of *Haplocrinus* which has long escaped notice. Goldfuss² long ago described the furrows which mark the sutures between the oral plates, and went on to say "wo diese im Scheitelpuncte zusammenstossen, steht ein rundes Knöpfchen." This is quite clearly shown in his figures, but has attracted no attention from subsequent workers. Lately, however, it has been discovered by Mr. Wachsmuth that there is really a small but distinct plate in this position, occupying the central portion of the summit of the oral pyramid. I am indebted to him both for the opportunity of verifying this observation by examination of his specimen of *Haplocrinus mespiliformis*, and for permission to make use of it in this chapter. This plate is one of considerable importance in its morphological relations. In accordance with the views which I have expressed elsewhere,³ I believe it to be the representative on the actinal side, or left larval antimer, of the dorsocentral plate which is developed in the centre of the right antimer or abactinal side of Urchins, Stellerids, and Crinoids. I have reason to think that this belief has been adopted by Mr. Wachsmuth not only so far as regards *Haplocrinus* and *Symbathocrinus*, but also for the Platycrinidæ and Actinocrinidæ as well. The orals, as shown by Goette,⁴ are the actinal representatives of the basals, being developed spirally around the left vaso-peritoneal tube; while the basals, like the so-called genitals of Urchins and Starfishes, appear in a spiral around the right peritoneal tube. They are disposed interradially, and rest in most cases directly against the dorsocentral; while the orals of *Haplocrinus*, also interradially, rest against the single plate discovered by Wachsmuth, which occupies a central position in the summit, immediately above the peristome, as in so many other Palæocrinoids. I propose to call it the "orocentral."

In the remarkable series of specimens of *Allagecrinus*⁵ which have been obtained by the collectors of the Geological Survey of Scotland, the smallest and least developed individuals are in the same morphological condition as *Haplocrinus*, or perhaps even in a more primitive one. The calyx is covered by a round dome of oral plates, which rests

¹ Schultze, Echinodermen des Eifler Kalkes, p. 105.

² Petrefacta Germaniæ, Theil. i. p. 214, tab. lxiv. figs. 6b, 6c.

³ Quart. Journ. Micr. Sci., 1879, vol. xix., N. S., pp. 179-182; 1884, vol. xxiv. p. 14.

⁴ Loc. cit., p. 621.

⁵ Ann. and Mag. Nat. Hist., 1881, ser. 5, vol. vii., pp. 282-289.