

None of the Neocrinoids, however, have permanently imperforate radials as so many Palæocrinoids have, the latter group remaining in an embryonic condition as stated already.

In by far the larger number of Neocrinoids which have divided rays, the axillary is the third of the primary radials. The only exceptions are *Metacrinus* and *Plicatocrinus*. In the former genus (Pl. XXXIX. fig. 1; Pl. XLVI.) the first and the axillary radials are primitively separated by from three to six joints, some of which afterwards become united by syzygy; while in *Plicatocrinus* there appear to be only two radials altogether, the first and the axillary. Zittel¹ describes three, it is true, or rather two radials and an axillary brachial; but he speaks of the "innig verschmolzenen Plättchen der unteren Zone" as quite small, and I am strongly inclined to suspect that they represent basals rather than first radials. For what he calls the second radials seem to me to be the first or calyx radials. They are the large trapezoidal plates forming the greater part of the calyx, and united to the lower series by suture; and such a mode of union of the two lower radials occurs in no other Neocrinoid except *Guettardicrinus*.

The position of the axillary joint in those Palæocrinoids which have divided rays is by no means so fixed as in the younger types, for the first radials themselves may be axillary as in *Allagecrinus*; while in *Poteriocrinus radiatus* the axillary is the sixth joint beyond the first radial, as in some species of *Metacrinus* (Pls. XLIV., XLVI., XLVII.-L.); and in other genera its position may be anywhere between these two extremes. This is in fact the only important character which distinguishes the Palæozoic *Erisocrinus*, *Philocrinus*, and *Stemmatocrinus* from the well known Triassic genus *Encrinus*. *Erisocrinus* has distinct under-basals like those of *Encrinus*, though relatively larger; but in *Stemmatocrinus*, according to Wachsmuth and Springer,² these plates are represented by a flat disk, which is undivided, regularly pentagonal, and extends considerably beyond the periphery of the column. Trautschold³ appears to take the same view of *Stemmatocrinus*. Tempting as it may be, owing to the way in which it would increase the resemblance between these types and *Encrinus*, I feel somewhat loth to accept it. For the plate in question appears to me to be much more truly represented by the central pentagonal piece on which the basals of *Cupressocrinus* rest; this is larger than the stem-joints beneath it, and is obviously what Schultze⁴ calls it, viz., "Eine fünfseitige, aus der Erweiterung des obersten Säulengliedes gebildete Platte." Unfortunately we are not acquainted with the mode of development of the under-basals, as they occur in no recent Crinoid; but the analogy of the development of the other calyx-plates indicates that they are primitively five separate plates, like their homologues in the apical system of Ophiurids and Starfishes; and a theory which would homologise them with a plate that first appears as a simple ring, seems to me to run counter to all true

¹ Ueber *Plicatocrinus*, *loc. cit.*, pp. 107, 108.

² Revision, part i. p. 141.

³ Einige Crinoideen und andere Thierreste des jüngeren Bergkalks im Gouvernement Moskau, *Bull. Soc. Imp. des Nat. Moscou*, 1867, p. 28.

⁴ *Op. cit.*, p. 15, Taf. ii. figs. 1 a, 6 a.