

(Pl. XXIV. fig. 9, *ico*, *cco*). The canal in which this is lodged is never close down to the proximal openings in the inner or dorsal face, as it is in all Comatulæ, even *Atelecrinus*. But its position varies somewhat in different species. Thus, for example, it comes nearer to the edge of the central funnel in *Pentacrinus decorus* (Pl. XXXIII. fig. 5) than in *Pentacrinus wyville-thomsoni* (Pl. XX. fig. 6). The double axial cords of the rays which proceed outwards from it resemble those of Comatulæ in their very close approximation. Small portions of them, cut very obliquely, are seen in Pl. XXIV. fig. 9, A. They are lodged close together in the same canal as far as the axillary radial, not being so widely separated as in *Encrinus*; and the arrangement of the commissures in the axillary is just the same as was discovered by Ludwig in the Comatulæ.

D. *The Geological History of Pentacrinus.*

Excepting for some doubtful forms from the Eifel, the earliest known Pentacrinidæ occur in the "Wellenkalk" of the Jura, at an horizon somewhat lower than the well-known limestone in which *Encrinus liliiformis* occurs. According to Quenstedt, both generic types occur together in the Wellenkalk of Württemberg; and he refers all the Pentacrinidæ to one species, *Pentacrinus dubius*, though they have received various other names, both generic and specific, from earlier writers. Nothing being known of them but fragments and isolated joints of the stem, any detailed classification of them is hardly possible. But the similarity of the stem-fragment from Waltershausen¹ with ten cirrus-whorls at intervals of eight or ten joints, to the stems of recent Pentacrinidæ, is very striking. This resemblance was noticed by von Schlotheim,² who described the fossil as *Pentacrinus vulgaris*, and referred to the same type the recent specimens of Guettard and Ellis. Some years later Quenstedt³ gave an excellent figure of it; but in the absence of an associated calyx he hesitated to refer it to *Pentacrinus* as von Schlotheim and Goldfuss had done, and so described it as *Encrinites dubius*. Beyrich and later writers, however, have generally regarded it as a *Pentacrinus*, as Quenstedt himself has done in the Encriniden, and the reference of the fossil to the Pentacrinidæ will now be scarcely disputed. Another very similar stem from the Muschelkalk of Silesia was described by von Meyer⁴ as *Chelocrinus acutangulus*. This genus was established to receive certain forms with more than ten arms, owing to the presence of distichal and palmar series, which had been generally referred to *Encrinus*. It has been abundantly proved, however, by the researches of von Strombeck⁵ and others,

¹ Encriniden, p. 198, Tab. 97, figs. 14-22.

² Die Petrefactenkunde, p. 327.

³ Ueber die Encriniten des Muschelkalks, *Archiv f. Naturgesch.*, Jahrg. i. Bd. ii., 1835, p. 225, Taf. iv. fig. 2.

⁴ Fische, Crustaceen, Echinodermen und andere Versteinerungen aus dem Muschelkalk Oberschlesiens, *Palæontographica*, Bd. i., 1851, p. 272.

⁵ Ueber Missbildungen von *Encrinus liliiformis*, Lam., *Palæontographica*, Bd. iv., 1856, p. 176.