

(Pl. XXVI. figs. 5, 8; Pl. XXXVII. figs. 3, 4; Pl. L. figs. 6, 7, 12, 13) like the apposed surfaces of the radials and basals respectively (Pl. XX. figs. 2, 3, 6, 9). This is also the case in *Rhizocrinus*, which presents another peculiarity as well. Near the dorsal edge of the upper face of the hypozygal there is a more or less well-marked pit (Pl. X. figs. 1, 6, 8, 18), and a corresponding peg-like process projects from the under face of the epizygal (Pl. X. figs. 17, 19), so that closeness of union is effected in this way instead of by the usual radiating ridges.

Another arrangement which effects a somewhat closer syzygial union than usual, presents itself in the arms of *Pentacrinus naresianus* (Pl. XXX. figs. 20, 21, 23; Pl. XXXa. figs. 9, 10, 12) and of *Pentacrinus blakei* (Pl. XXXII. figs. 4, 5, 7, 9, 12, 14). The apposed surfaces are not flat or slightly curved, but the proximal face of the epizygal rises to a sharp crest which is interrupted by the central canal, and fits into a corresponding re-entering angle on the distal face of the hypozygal, so that the two joints interlock very closely. This peculiarity is very apparent in a side view of the arm (Pl. XXX. fig. 23); but when seen from the dorsal side, the distal edge of the hypozygal appears to be very convex and to project strongly forward into the epizygal (Pl. XXX. fig. 1; Pl. XXXI. fig. 2).

Very different modes of articulation occur in the Crinoid skeleton, so that the amount of play between two successive joints varies considerably. It is probably at a minimum in the stem of *Hyocrinus* (Pl. VI. fig. 2). We do not know the nature of the basal part of the stem; but the lower joints of the fragment, 170 mm. in length, which was obtained, are cylindrical, with their terminal faces devoid of any fossæ, but marked by a radiating pattern of grooves and ridges. This, however, is sometimes absent, as shown in Pl. Vc. fig. 4. Sir Wyville Thomson spoke of the joints as united by a close syzygial suture;¹ but the ligamentous fibres which effect their union (Pl. Vc. fig. 5, *ls*) are longer than I have ever seen them in any real syzygy, and rather resemble those which unite the successive pinnule joints of other Crinoids when muscles are absent. They are all of the same length and not longer in the centre than at the periphery, as they are between the deeply hollowed stem-joints of the Bourgueticrinidæ (Pl. VIIa. figs. 8–11; Pl. X. figs. 11–14). But I should hardly describe this mode of union as a syzygy (or suture); for there must have been some amount of play between the successive joints, and a syzygy was described by Müller as an immovable sutural union of two joints.²

Next to *Hyocrinus*, the Pentacrinidæ have the most closely united stem-joints. In this family each internode of the stem contains five oval bands of elastic fibres (Pl. XXIV. figs. 1, 3–5, *ls*). They run through all the joints between the hypozygal of one syzygy and the epizygal of the next below it, which is the true nodal joint. Müller³ and Wyville

¹ Notice of new living Crinoids belonging to the Apiocrinidæ, *Journ. Linn. Soc. Lond. (Zool.)*, vol. xiii. p. 52, 1876.

² *Op. cit.*, p. 39.

³ *Op. cit.*, p. 17.