

Pl. XXXII. figs. 1, 2; Pl. XXXVII. figs. 5-8, 19, 21; Pl. XXXIX. figs. 3, 5, 6; Pl. XLI. figs. 5, 15; Pl. XLV. figs. 3, 5, 6; Pl. XLVII. figs. 1-3; Pl. L. figs. 4, 20, 21; Pl. LI. figs. 5-8).

The external line of separation frequently disappears altogether, or is only traceable with great difficulty, and the two joints, primitively separate, become practically fused into one (Pl. XLII. fig. 1; Pl. L. fig. 3). I cannot find any mention of this peculiarity in the classical memoir of Johannes Müller,¹ who spoke of the successive unions of the stem-joints indifferently as "Näthe oder Gelenke." So far as I can make out, it was first noticed by Sir Wyville Thomson in *Pentacrinus decorus*;² and Lütken³ subsequently described it in more detail in *Pentacrinus asteria* and *Pentacrinus mülleri*. Quenstedt⁴ also noticed it in the fossil species *Pentacrinus scalaris* and *Pentacrinus jurensis*.

An essentially similar mode of union between certain of the arm-joints was spoken of by Müller as a "syzygy," and described as an immovable sutural union. The name syzygy has since been applied to the sutural union of the nodal stem-joints with those next below them; and Müller's terms "hypozygal" and "epizygal" for the two arm-joints which are united by syzygy (Pl. XII. figs. 7, 10, 18, 21; Pl. XXXa. figs. 9, 10, 12; Pl. XXXII. figs. 4, 9, 15, 18) may be conveniently applied in the case of the stem-joints also.

In all the recent Comatulæ the apposed faces of the two portions of a syzygial joint are marked by a series of slightly elevated ridges with alternating furrows, which radiate from the opening of the central canal towards the dorsal margin of the joint. In *Actinometra typica* these ridges are frequently not perfectly continuous; but they are broken up into a row of little elevations, squarish or oblong in shape, and arranged with their longer axes radiating outwards from the central canal. On some joints these are not very numerous, and as their terminal faces are marked by median vertical lines, they have been wrongly described as surfaces effecting a ligamentous articulation of the bifascial type, such as will be described immediately.⁵

The radiating arrangement is usually much less marked in the Pentacrinidæ than in the Comatulæ, the striation being frequently only visible at the extreme marginal portions of the syzygial surfaces (Pl. XII. figs. 7, 10, 18, 21; Pl. XXI. figs. 1*d*, 2*d*, 5*a*; Pl. XXX. figs. 20, 21) as figured by Müller in *Pentacrinus asteria*,⁶ while in some cases it appears to be absent altogether, the apposed faces being perfectly smooth

¹ Ueber den Bau des *Pentacrinus caput-Medusæ*, *Abhandl. d. k. Akad. d. Wiss. Berlin*, 1843.

² Sea Lilies, *The Intellectual Observer*, No. 31, August 1864, p. 7.

³ Om Vestindiens Pentacriner, med nogle Bemaerkninger om Pentacriner og Söililier i Almindelighed, *Vidensk. Meddel. f. d. nat. Foren. i Kjöbenhavn*, 1864, Nos. 13-16, pp. 198, 199.

⁴ Petrefactenkunde Deutschlands, Bd. iv., Asteriden und Encriniden, pp. 196, 230, Taf. 98, figs. 2, 3, 107.

⁵ See Lovén, Phanogenia, ett hittills okänt slägte af fria Crinoideer, *Öfversigt k. Vetensk.-Akad. Förhandl.*, Årg. xxiii., No. 9, p. 230, fig. c; and also P. H. Carpenter, The Comatulæ of the Leyden Museum, *Notes from the Leyden Museum*, vol. iii. pp. 197-199.

⁶ *Op. cit.*, Taf. ii. fig. 4.