

same side of the stem as the third cirrus in the seventh whorl. But the ninth whorl has only two cirri instead of three, and is the beginning of a new cycle; for the tenth whorl is not like the sixth with only two cirri, but resembles the irregular eighth one with three. In the same way the eleventh whorl is like the ninth and not the seventh, and so on.

The absence of cirri at some of the nodes of *Pentacrinus alternicirrus* is the more striking as there are regularly five cirri at each node in all the Pentacrinidæ, both recent and fossil, with three exceptions. These are *Pentacrinus bronni*, Hagenow,¹ from the White Chalk of Rügen, and *Pentacrinus didactylus*, d'Orbigny,² from the Eocene of Biarritz, both of which have only two cirri at a node; while under the name of *Pentacrinus tridactylus*, Quenstedt³ has described another Tertiary stem-fragment from Le Vit in the south of France, which has a verticil of three cirri only. It is just possible that if longer pieces of these stems were known they might show the same regular alternation in the positions of the successive cirrus-whorls which is so striking in *Pentacrinus alternicirrus*. But whether this be the case or not, the departure from the pentamerous arrangement of cirri which is so characteristic of the Pentacrinidæ is not a little remarkable. For verticils of two cirri alternating with one another in position sometimes occur in both *Bourgueticrinus* and *Mesocrinus*; though the structure of the stem in these genera is totally different from that of *Pentacrinus*, as has been fully explained in Chapter II.

In consequence of the absence of two or three cirrus-sockets, the nodal joints of *Pentacrinus alternicirrus* depart considerably from the symmetrical form presented by those of other Pentacrinidæ, as is shown in Pl. XXVI. figs. 13, 14, and Pl. XXVII. figs. 2, 3. The last two represent syzygial faces of two successive nodes in their relative positions, the two empty sides in fig. 2 being occupied by sockets in fig. 3.

Apart from the arrangement of the cirri, *Pentacrinus alternicirrus* resembles *Pentacrinus maclearanus* and *Pentacrinus mülleri* in the shortness of the internodes, while it agrees with both these species and also with *Pentacrinus wyville-thomsoni* in the regularity and the grouping of the arm-divisions. The general arrangement of the crown of arms (Pl. XXV.) is most like that of *Pentacrinus wyville-thomsoni* (Pl. XIX. fig. 1); and the long middle pinnules of the two species are very similar, while the characters of the perisomatic skeleton are almost identical (compare Pl. XVII. figs. 2-4, and Pl. XXVII. figs. 4-6).

The leading characters of *Pentacrinus alternicirrus* appear to be very constant, the South Pacific specimen from near the Kermadecs being in no way distinguishable from those dredged off the Meangis Islands. This is a striking contrast to the variations of

¹ Monographie der Rügenschcn Kreide-Versteinerungen, *Neues Jahrb. f. Mineralogie*, Jahrg. 1840, p. 663, Taf. ix. fig. 9.

² See d'Archiac, Description des fossiles recueillis par M. Thorent, dans les couches à nummulines des environs de Bayonne, *Mém. Soc. géol. de France*, 2^me sér., t. ii. 1^{re} partie, 1846, p. 200, pl. v. figs. 16a, 17a.

³ Encriniden, p. 268, Tab. 99, fig. 170.