

very different from that of *Marsupiocrinus*, and is more like that of the Actinocrinoid; but the apical dome plates (orocentral and orals) take up the greater part of the summit, so that the radial dome plates are but little developed, and do not follow the arrangement of the calyx plates, as described by Wachsmuth in *Strotocrinus* and other Actinocrinidæ. Those of *Platycrinus* extend on to the free rays as a double row of alternating plates. Wachsmuth says nothing about the covering of the arms; but there are two rows of alternating plates on the pinnules, and these are obviously covering plates. It is difficult to believe that the food-grooves of the arms were unprotected, when those of the pinnules borne by them were bordered by covering plates; and if these were present on the arms, what was their relation to the two alternating rows of radial dome plates upon the free rays? Should not the alternating plates of the free rays, arms, and pinnules be considered as parts of one system, just as the small covering plates of the pinnules of Pentacrinidæ are traceable into the larger ones on the arms, and through them into those of the disk (Pl. XVII. fig. 7; Pl. XXXIII. figs. 3, 4, 6; Pl. XLI. figs. 4, 13; Pl. LIV. fig. 7)?

The free rays of *Platycrinus* find a parallel in many recent Crinoids. In *Platycrinus burlingtonensis* the first division borne on the radial axillary consists of two joints only, of which the second is axillary. "One face of this bears an arm directly, while the other supports two pieces in direct succession, the second of which is an axillary piece and gives origin to two arms."<sup>1</sup> This arrangement would be described in a *Pentacrinus* or *Comatula* as consisting of two distichal and two palmar joints, the latter only occurring on the inner pair of every two secondary arms; so that the arm formula would be 1, 2, 2, 1, instead of 2, 1, 1, 2 as in *Pentacrinus alternicirrus*, &c. (Pl. XXV.). Many Comatulidæ and Pentacrinidæ have more than two joints in the distichal and palmar series, and these do not belong to the arms proper, but support radiating extensions of the disk, which is often much incised and heavily plated (Pl. L. fig. 2; Pl. LV. figs. 3-7). In the dry state the plates remain attached to the distichal and palmar joints, and cover them in by a kind of vault (Pl. XXXIII. fig. 6), just as the radial dome plates cover in the free rays of *Platycrinus*, though on a much smaller scale. As in the case of *Cyathocrinus* and *Marsupiocrinus*, therefore, I believe that these alternating radial dome plates of *Platycrinus* are really covering plates of the ambulacra, though permanently closed down, and terminating against the primary radial plates of the dome outside the ring of proximals.

These primary radials are sometimes well developed, as in *Talarocrinus* and *Pterotocrinus*. In the former<sup>2</sup> "the first radial vault-piece is spiniferous in most species, the succeeding plates small and nodose, arranged longitudinally in rows, forming together regular arches over the ambulacral passages within the body." The vault of *Pterotocrinus* seems to have had a closer resemblance to that of *Actinocrinus* than is the case in most

<sup>1</sup> Paleontology of Illinois, vol. v. p. 453, pl. iii. fig. 6.

<sup>2</sup> Revision, part ii. p. 86.