

process and represent the unabsorbed lateral portions of the primary layer forming the embryonic basal plate. The ventral side of the basal ray in the three species of *Actinometra* which are figured on Pl. IV. figs. 5a, 4b, 6b, a, is marked by a relatively large depression which forms the central end of the axial interradian canal. This descends into the calyx over the apposed lateral edges of two radials, as is well seen in Pl. III. figs. 1d, 7c, and Pl. V. fig. 2c. But in most cases it ends blindly without reaching the dorsal surface of the radial pentagon at all.

D. THE RADIALS.

The radials of Comatulæ differ considerably from those of the Pentacrinidæ, the family of Stalked Crinoids to which the free forms are most closely allied. In *Pentacrinus*, as in the Pentacrinoid larva of *Antedon* (Pl. XIV. figs. 2-9), the first radials appear above the basals on the exterior of the calyx as relatively large convex plates. They retain this character in *Thaumatocrinus* and to a less degree in *Atelecrinus* (Pl. VI. figs. 5, 7), both of which are permanent larval forms in other respects. But in the two large genera *Antedon* and *Actinometra* there is a very considerable amount of variation in the extent to which the first radials appear externally. Some forms, such as *Antedon eschrichti*, show no indication of them at all (Pl. XXIV. fig. 11), or only traces of their angles in the interradian portions of the calyx (Pl. I. fig. 8a); while in other cases, such as *Antedon elegans*, *Antedon longicirra* (Pls. VIII., XVII.), and *Antedon macronema* (Pl. IV. fig. 3a; Pl. XXXVIII. fig. 5), they exhibit a relatively large outer surface between the edge of the centro-dorsal and the second radials. Between these two extremes every intermediate gradation may be traced. The former is due to the gradual enlargement of the centro-dorsal, which spreads itself over the base of the calyx towards the end of Pentacrinoid life and sometimes conceals the first radials altogether, as described by Dr. Carpenter¹ in *Antedon rosacea*. The second radials thus appear to spring directly from the centro-dorsal (Pl. XIII. fig. 2); and this has sometimes led to species of Comatulæ being described as having only two radials. In fact d'Orbigny² described a new genus *Comatulina*, for a fossil species in which there are no external basals and "les bras s'articulent immédiatement sans intermédiaires à la pièce centrale pourvue de ramules." The full-grown *Antedon acæla* presents this appearance, but the younger specimen figured on the same plate (Pl. XVI.) shows comparatively large first radials; while a more mature individual (Pl. II. figs. 3a, 3c) shows relatively less of them, owing to the spread of the centro-dorsal. The figures of *Antedon phalangium* on Pl. XXVIII. show similar differences of growth, though in a less degree.

The various species of *Actinometra* exhibit among themselves essentially the same

¹ *Phil. Trans.*, 1866, p. 742.

² *Cours élémentaire de Paléontologie et de Géologie Stratigraphique*, 1850-52, vol. ii. p. 139.