

separates itself from the stem-joint below it, and the "head" of the Pentacrinoid larva becomes a free-swimming Feather-star, the rest of the larval stem being left to waste away. The precise epoch of growth at which this separation occurs varies greatly. Thus, for example, the young *Antedon tenella* retains its stem until twenty or thirty cirri have appeared on the centro-dorsal, which conceals the basals, and the pinnules are developed upon all the lower arm-joints; whereas in *Antedon rosacea* and in other species, the stem is discarded when there are only ten cirri on the centro-dorsal, the basals are still visible, and the lowest portions of the arms devoid of pinnules; while the absolute size which is reached by the mature larva before dropping off its stem varies considerably.

After the formation of the first two whorls of cirri no special regularity can be traced in the manner of their development. The young ones normally appear between those previously formed and the radial pentagon, so that their sockets are close to the margin of the centro-dorsal (Pl. I. fig. 1*a*; Pl. II. figs. 2*a*, 4*a*; Pl. IV. figs. 1*a*, 3*a*). But as the centro-dorsal grows and new cirri appear round its margin, the older cirri which are attached close to the dorsal pole drop away, and their sockets become gradually obliterated by calcareous deposit. The earlier stages of this process are seen in Pl. I. fig. 6*a*; Pl. II. figs. 1*a*, 3*a*, 5*a*; and Pl. III. figs. 6*d*, 7*a*; and the result is that the dorsal surface is usually left comparatively smooth, as seen in Pl. IV. figs. 1*a*, 1*b*, 2*a*, 3*a*, but in some species of *Antedon* the deposit of new material continues after the cirrus-sockets are obliterated, and causes the dorsal pole to become rough and irregular (Pl. III. figs. 4*b*, 5*a*; Pl. XI. fig. 3). On the other hand, the lower surface of the centro-dorsal in most species of *Actinometra* is almost flat and extremely smooth (Pl. V. figs. 1*b*, 1*d*, 2*b*, 2*d*, 2*e*, 4*b*, 5*b*, 5*c*). This is owing to the very extensive and uniform manner in which the new material is deposited, and it sometimes produces very singular results, as will be explained subsequently.

During the Pentacrinoid stage of larval existence the young *Comatula* is provided with a stem which encloses a neuro-vascular axis just as in an ordinary Stalked Crinoid. This axis contains the downward extensions of the peripheral cavities of the chambered organ within the centro-dorsal and of its central axis. When the centro-dorsal separates itself from the lower part of the larval stem, a minute five-rayed perforation remains at its dorsal pole, which corresponds to the central canal in the stem of a *Pentacrinus*, and gave passage to the neuro-vascular axis above mentioned. In recent *Comatulæ* this opening is closed up very soon after the entry upon the free stage of existence, by a portion of the calcareous deposit already noticed; though traces of it are sometimes visible internally upon the floor of the centro-dorsal cavity (Pl. II. figs. 2*b*, 3*b*). There are some fossil *Comatulæ*, however, in which it seems to have remained permanently open throughout life, so far as we can judge from the material at our disposal; while in other forms again it is extended into a large stellate impression which occupies a considerable space on the lower surface of the centro-dorsal, and in the fossil condition is