

they do not appear within the middle portion of the centro-dorsal in the specimen of *Antedon eschrichti* figured in Pl. I. fig. 8*d*, though they are comparatively large in other forms of this type, as I have noticed elsewhere.<sup>1</sup>

The peripheral part of the ventral surface of the centro-dorsal is divided by ridges or grooves into the five trapezoidal areas in which the radial plates are lodged, and they are occasionally marked by more or less definite pits which receive the ends of the radial axial canals, as already explained (Pl. IV. figs. 1*d*, 2*d*). In most Comatulæ every two fossæ are separated by one of the five basal grooves which lodged the rays of the basal star, to be described subsequently. They are sometimes comparatively insignificant, as in *Antedon antarctica* (Pl. I. fig. 6*d*), while in the Pacific species they are usually very strongly marked (Pl. II. figs. 1–5*b*). On the other hand, if no basal star is present, the radial fossæ on the centro-dorsal are usually separated by tolerably sharp ridges as in *Antedon eschrichti* (Pl. I. fig. 8*d*), *Antedon quinduplicava* (Pl. IV. fig. 1*d*), and *Antedon disciformis* (Pl. IV. fig. 2*d*). The last-mentioned species, however, has indications of basal grooves at the proximal ends of these ridges. The grooves are fairly distinct in both the species of *Promachocrinus* which I have examined, but though the radials are ten in number, there are only five fossæ on the centro-dorsal, the ventral surface of which is distinctly pentagonal in outline, with its angles interradial, just as in *Antedon* (Pl. I. figs. 1*c*, 1*d*, 5).

In fact, I know of no *Comatula* in which the general shape of the centro-dorsal is not more or less distinctly pentagonal with its ventral ridges and angles interradial. Wachsmuth and Springer regard this fact as indicating the probable presence of radially situated under-basals in the *Comatula*-larva. Their extensive and important investigations into the structure of the calyx in the Palæocrinoids have led them to formulate the following rule:<sup>2</sup>—“In species with under-basals, whenever the column is pentangular, its longitudinal angles are directed interradially, the sides and columnar cirrhi radially.”

They proceed to state<sup>3</sup> that the centro-dorsal of Comatulæ is interradial “and rests, as in the Apiocrinidæ, against the outer face of the basals, not within the basal ring”; while they continue—“upon this mainly we base the opinion that perhaps also the Comatulæ in their early larva had rudimentary under-basals. That these plates, if present, were not observed, is not surprising, as they may have been very minute and been covered entirely by the column.”

Whether this be the case or not, the statement that the centro-dorsal of Comatulæ rests against the *outer* face of the basals is a somewhat misleading one. The “outer face” can only mean that which appears on the outside of the calyx; and this, from its very nature, cannot rest against the centro-dorsal, for it would then be internal and concealed.

<sup>1</sup> *Quart. Journ. Geol. Soc.*, 1890, vol. xxxvi. p. 47.

<sup>2</sup> Revision of the Palæocrinoida, pt. iii. sect. 1, p. 7 (229); *Proc. Acad. Nat. Sci. Philad.*, 1885.

<sup>3</sup> *Ibid.*, sect. 2, 1886, p. 298 (222).