radial pentagon, one at the inner end of each radial (Pl. III. fig. 6*b*; Pl. IV. fig. 2*c*). These are the dorsal ends of the radial axial canals, which do not become obliterated as is usually the case; and in *Antedon disciformis* there is a small pit on the upper surface of the centro-dorsal corresponding to each of these canals which terminate blindly in this position (Pl. IV. figs. 2*c*, 2*d*). Among recent Comatulæ, however, the most striking development in this respect is presented by *Antedon quinduplicava;* for the radial axial canals which pass over from the ventral to the inner faces of the radials turn outwards again at the bottom of the calyx, and expand into relatively large bilobate cavities which are formed by excavation in the apposed surfaces of the radials and the centro-dorsal respectively, as is well seen in Pl. IV. figs. 1*c*, 1*d*.

Among the fossil Comatulæ there are several species in which the ventral surface of the centro-dorsal is marked by five small radial pits of this kind, that receive the ends of the radial axial canals. But in *Antedon retzii* they appear as actual perforations in the ventral surface of the centro-dorsal which reach downward to the bottom of its internal cavity, being in fact only separated from it by a narrow septum, and this is occasionally absent, so that the centro-dorsal cavity which is naturally decagonal or pentagonal in outline becomes stellate. This condition is very common in the stem-joints of some Palæocrinoidea, such for example as *Cupressocrinus*, and I think there can be no doubt that the radial openings or the extensions of the central canal in all such cases served for the passage of canals containing water in communication with that in the cœlom above.

Messrs. Wachsmuth and Springer[1] suggested long since that the complex stem of many Palæocrinoids might have been "subservient to respiration"; and the facts mentioned above respecting the Bourgueticrinidæ and the Comatulæ certainly go far towards supporting this view.

The ventral surface of the centro-dorsal is usually flat or slightly hollowed, rarely very convex, except in species like *Actinometra paucicirra*, *Actinometra typica*, &c., in which the greater part of the centro-dorsal is enclosed within the radial pentagon, as will be explained shortly. The internal openings of the canals leading to the cirrus-sockets are frequently visible on the floor of its cavity, as is well shown in *Promachocrinus kerguelensis* and in *Antedon antarctica* (Pl. I. figs. 1*d*, 6*d*). In both these species and also in others the walls of the centro-dorsal cavity are marked by strong ribs, the lower ends of which are more or less distinctly visible through the axial opening, projecting beneath its lip, which their upper ends help to support. Five of them, those at the interradial angles, are often considerably larger than the rest, and may be the only ones visible. In other cases, however, both these and numerous smaller intermediate ribs are visible through the axial opening, as is seen in Pl. I. figs. 1*d*, 6*d*. These ribs are much more distinct in some individuals than in others of the same species. Thus, for example,

[1] Revision of the Palæocrinoidea, part i. p 15, *Proc. Acad. Nat. Sci. Philad.*, 1879.