

dorsal" in the sense in which it is usually understood, *i.e.*, as the cirrus-bearing top stem-joint of the Comatulæ. The tubular body-chamber of *Holopus* is, however, distinctly not of this nature; so that the use of the name "centro-dorsal" is apt to lead to confusion. In a subsequent passage¹ de Loriol expresses another view of the composition of this cup or "cupule." He speaks of the axillaries which are articulated to its upper edge as "radiales uniques," resting as in *Cyathidium*, "sur les angles de la cupule, qui pourrait donc être envisagée comme étant composée de cinq pièces basales interradales." This would be a most singular morphological condition, and one without a parallel in any other Crinoid. Primary radials would be in contact with each other, but not united, and rest on articular surfaces each of which would be formed by the upper edges of two basals.

The union between basals and radials is invariably a simple synostosis such as I have described above (pp. 2, 3), and never a muscular joint like that between the upper edge of the calyx-tube of *Holopus* and the compound axillaries. The evidence afforded by sections of the cup, however, indicates clearly that it is principally composed of closely united first radials which, as will be pointed out subsequently, have a remarkable similarity to the radials of the Liassic genus *Eudesicrinus*.

Sir Wyville Thomson thought it probable that second radials are also present in the cup. If so, they must be united to the first by synostosis, which would be a most unusual condition in any Neocrinoid; and the close resemblance of *Holopus* to *Eudesicrinus* seems to negative this idea altogether; while, as pointed out by Sir Wyville,² there would be a true muscular joint between the second radials and the radial axillaries, which is not the case in any other recent Crinoid.

Considering then the articular surfaces at the edge of the calyx tube as those of first radials, we find that they differ considerably in size. According to Sir Wyville Thomson³ "the upper border of the cup, bearing the facets, is very irregular in thickness; and in all the specimens which I have seen, including d'Orbigny's, one side of the border is much thicker and considerably higher than the other side, and the three arms articulated to it are much larger than those articulated to the opposite side. There is thus a very marked division into "bivium" and "trivium," and consequently a bilateral symmetry underlies the radiated arrangement of the antimeres." This is shown in Pl. V. fig. 1, and also, though less clearly, in Pl. III. fig. 1. Besides this again the individual facets, both of bivium and trivium, are of different sizes and shapes. The articular ridge which crosses the central facet of the trivium is considerably longer than that of either of the two remaining facets, and these are longer than the ridges on both the bivial facets. The adjacent muscular plates of these two last are fused into a short tongue-shaped process which stands up prominently in the angle of the bivium. It is essentially of the same nature as the "clavicular piece" which projects in the middle of the distal

¹ Paléont. Franç., *loc. cit.*, p. 191.

² *Loc. cit.*, pp. 407, 408.

³ *Loc. cit.*, p. 408.