

organ, first into two (Pl. XXIV. fig. 6, *v*), and then into four or more; while the peripheral vessels around it expand into the chambers (Pl. XXIV. figs. 6, 8; Pl. LVIII. figs. 1-3—*ch*), just as they do on a smaller scale within the nodal stem-joints (Pl. XXIV. fig. 4, *chn*).

As the ascending vascular axis of *Pentacrinus decorus* passes out of the basal ring, and enters the central plug within the radial pentagon, the chambers become elongated and pear-shaped in the direction of the rays; and at the same time their cavities are traversed by trabeculæ, which break them up into numerous smaller cavities that contain masses of yellowish-brown pigment-granules (Pl. LVIII. fig. 2, *ch*). Some of these spaces have a definite epithelial lining, like the chambers with which they are connected, while others are deficient in this respect. Before reaching the level of the circular commissure, however, these radial extensions of the outer vessels of the plexiform gland terminate somewhat abruptly; and the gland is reduced to a small but compact bundle of vessels in the middle of the central plug.¹ As it rises it becomes extended laterally, and its shape when it enters the visceral mass (as seen in section) is that of a more or less irregular L; while this soon passes into a lobular form of the usual variable character.

The appearance of these radial extensions of the lowest part of the plexiform gland in *Pentacrinus decorus* forcibly recalls Koehler's description of the minute structure of the ventral end of the ovoid (plexiform) gland in the Urchins. This is connected with the oral ring by a single vessel, which is called by Koehler the glandular canal. The other end of the gland is said by the French anatomists to open externally through the madreporite in all the Echinozoa, together with the water-tube; though both in Asterids and in Ophiurids Ludwig has described it as connected with an aboral vascular ring in which the genital vessels arise, and there is strong reason to believe that the same is the case in the Urchins too.

It will be a matter of no little difficulty to determine exactly the portions of the blood-vascular system of a Crinoid which are represented in a Starfish or Urchin; and the question will probably only be satisfactorily settled by careful studies in organogeny. There is no doubt about the oral ring upon the one side of the disk, and the chambered organ on the other. But where is the line to be drawn between the two?

It seems to me not unlikely, as I have suggested elsewhere,² that the labial plexus of Crinoids may represent the aboral ring of the Echinozoa, the plexiform gland being much shortened, but expanded laterally instead. Both the intervisceral and the genital vessels are in communication with it, just as they are with the aboral ring of Asterids, according to Ludwig; and in this class too the plexiform gland is continued upwards beyond the

¹ The upward passage of the chambers into the peripheral cavities of the lower part of the gland is better shown in the section next to that represented in Pl. LVIII. fig. 2.

² *Quart. Journ. Micr. Sci.*, N. S., vol. xxi., 1881, p. 185; and also Notes on Echinoderm Morphology, No. V.; On the Homologies of the Apical System, with some Remarks upon the Blood-vessels, *Ibid.*, N. S., vol. xxii., 1882, p. 375.