

by the blood-vascular plexus (Pl. LVII. figs. 1, 4, *lv*), which has a water-vascular trunk on each side of it; and the water-tubes extend outwards in a radial direction as long as the water-vessels remain double. This is very evident in some horizontal sections through the upper part of the disk of *Pentacrinus naresianus*, which were made for Sir Wyville Thomson by Dr. Stirling. The double row of water-tubes may be seen extending along the sides of the ambulacra beneath the line of tentacles, to a distance of 3.5 mm. from the peristome, and then it is not complete.

The position of the water-tubes beneath the primary ambulacra is well shown in Pl. LVII. figs. 1, 3, 4. They are seen, as it were, coiling round the subambulacral plates to open below into the upper part of the circumvisceral coelom. When, however, the radial extensions of the labial plexus gradually thin out and the two lateral water-vessels unite into a single median trunk, the water-tubes become less numerous, and are only found in the first two or three sections beyond the point of union. They are thus really in the same position as in the Comatulæ, if we consider the double water-vessels as expressing extensions of the angles of the water-vascular ring in the direction of the rays.

The water-pores which pierce the ventral peristome, whether it be plated or not, are in a close functional relation with the water-tubes. They are the openings of minute canals which are lined by columnar epithelium, and expand almost immediately into enlargements where the epithelium is ciliated (Pl. LVII. figs. 1, 3, 4; Pl. LIX. figs. 2, 4, 6—*wp*). The inner end of the canal beyond the enlargement is lined by pavement epithelium, and opens into the body-cavity. According to Perrier¹ the primary water-tubes of the early larval Comatulæ are directly continuous with the inner ends of the water-pores, without the intervention of the body-cavity.

He has not yet figured this connection, however; and after the careful observations of Ludwig upon the subject, with which my own are in complete accordance, I have considerable hesitation in accepting Perrier's statements, especially as he admits that the water-pores of mature Comatulæ do establish communication between the body-cavity and the exterior, just as described by Ludwig in the Cystid phase. This subject is discussed more fully elsewhere.² [See Appendix, Note D.]

In the smaller and simpler types of Crinoids the water-pores correspond in number to the water-tubes. The young *Antedon* has one in each interradius; and the same is the case in *Rhizocrinus*, the single water-pore piercing the oral plate. In *Hyocrinus*, however, the number of pores is larger. In both the specimens which I have examined there are two pores in the oral plate of the anal interradius, and there are no others in any of the anambulacral plates which lie between it and the edges of the radials. In the other interradii the disposition of the water-pores is as follows:—

¹ Sur le développement des Comatules, *Comptes rendus*, t. xviii., 1884, pp. 444–446.

² On some points in the Anatomy of Larval Comatulæ, *Quart. Journ. Micr. Sci.*, N. S., vol. xxiv., 1884, p. 320.