

One of these supplies most of the arms in the anterior division of the right ray, and the other most of those in its posterior division. But some of the arms in both divisions receive no groove at all; and there is only a faint line on the arm-bases indicating the course of the water-vessel which proceeds to the hindermost arms of this ray, while there is a similar line on the eastern side, indicating the course of the water-vessel supplying the hinder arms of the left ray. [Compare fig. 3 on p. 92.]

The posterior ray, however, has no separate ambulacrum of its own upon the disk; and the right limb of the usual horse-shoe shaped curve is therefore incomplete. At the point where the large and widely open primary groove-trunk forks into the two divisions of the right lateral ambulacrum, a faint line may be seen starting from its inner side. This is all that there is to represent the posterior ambulacrum. It curves backwards round the margin of the disk to its hinder edge, gradually becoming less and less distinct the farther it goes, until its ultimate branches to the arm-bases are only traceable with the greatest difficulty. All the arms of this ray are therefore unprovided with ambulacra, and with most of the structures which are correlated with their presence (Pl. LXI. fig. 3). They have neither blood-vessel nor ventral nerve, and their water-vessels are simple tubes like the integumentary water-vessels of the Molpadidæ.

These variations in the development of the ambulacra on the disk and arms of *Actinometra* have somewhat important morphological bearings, as will be explained in a later chapter. Curious malformations of the disk are occasionally to be met with among the Crinoids. Thus in the disk of *Metacrinus angulatus*, which is represented on Pl. XXXIX., there are two anal tubes of unequal size, between which I found a *Myzostoma* reposing. Three monstrosities of *Comatula* disks have also come under my notice. In one case, an *Antedon*, there are two anal tubes as in *Metacrinus angulatus*, but of more equal size; while in another, *Actinometra stelligera*, there are not only two anal tubes, but also two mouths (Pl. LVI. fig. 8). The true mouth is interradiar, and there is a large sub-central anal tube immediately behind it, as in all species of this genus. But there is also a second anal tube occupying the interval between the posterior ambulacrum which curves round the western portion of the disk, and the branches of the lateral ambulacrum on its eastern side. This is very irregular in its character, and expands at one portion of its course into a second peristome in which is a small mouth. Lastly, in a specimen of *Antedon rosacea* from Milford, only four ambulacra reach the central mouth, while the fifth (the left antero-lateral) has a second mouth all to itself (Pl. LVI. fig. 6).

A. THE ORAL PLATES.

The well-known oral plates which are so characteristic a feature in the Pentacrinoid larva of *Antedon* and *Actinometra* are resorbed before maturity is reached. But they persist through life in *Holopus*, *Hyocrinus*, *Rhizocrinus*, and *Thaumatocrinus*, imme-