

margin of the disk almost touches the pedicle of the parent to which the bud is attached. The pigment in the disk now approaches the condition in the adult.

The body-cavity of the buds at this stage thus glides insensibly into the first part of the pedicle, but the brevity of the latter organ gives rise to rapid changes in section. The next slice, indeed, shows the muscular fibres filling up the entire central area of the pedicle, while the septum proceeds only a short distance inwards from the dorsal wall. A somewhat radiate arrangement of the fibres also takes place, and is best marked ventrally in transverse section. After a short course the fibres terminate on the hypodermic covering of the end of the pedicle, which at this stage presents proportionally great development. The immature pedicle of the bud thus differs from that of the adult in the outline of the basement-layer, which is simply reniform in transverse section, whereas that of the adult presents two mamillæ on each side ventrally, and a median dorsal fold.

Externally, as indicated, the short pedicle almost immediately follows the anterior dorsal projection of the body; and as a peculiar curvature of the latter has now taken place, the tip of the pedicle scarcely projects beyond the margin of the disk. Shortly after reaching the stage just described, and while the symmetrical series of filaments on each side of the plumes is quite small, the bud separates from the parent. The pedicle and its sucker-like hypodermic termination are fairly developed; and as soon as it is detached (and sometimes before) a little bud appears near the tip. Thus the increase of the species by budding alone must be considerable, even comparatively young forms giving rise to a succession of buds. One or two buds are most frequently seen on the pedicle of the adult, though occasionally three or more exist.

Shortly before obtaining freedom the buds in some cases present a striking resemblance to certain stages in the buds of *Rhabdopleura*, as shown by Professor Allman. Thus in examples in which the first pair of plumes are very long and the succeeding short, while the stalk is in a state of extension, a condition closely approaching Professor Allman's figure 8<sup>1</sup> is produced.

The buds thus differ from those in *Rhabdopleura* in attaining freedom on reaching a certain stage, but both probably arise in a similar way, two at least of the embryonic layers taking part in their production. The first layer is represented by the dermal layers, nervous centre, buccal region, and the rectum, and the second by the skeletogenous tissue and longitudinal muscles. The presence of the third layer, as already mentioned, is more doubtful, though it is possible that the cells and globules observed towards the end of the pedicle may be of hypoblastic origin, being derived from the central region of the alimentary canal. The sections of the younger buds present, in the arrangement of the alimentary canal, a close resemblance to the young *Pedicellina*, as shown by the careful researches of Dr. Barrois and Mr. Harmer. The position of the

<sup>1</sup> *Quart. Journ. Micr. Sci.*, 1869, vol. ix., pl. viii.