

attachment on each sepal is a pair of external epithelioid cells of unknown function. Internally the calyx wall is lined with a chitinous intima, which is continuous with the intima of the crop wall proper. Scattered in the interspalary folds are slender longitudinal muscle cells; these are few in number and have no obvious function. They are inserted on the anterior face of the bulb and are continuous with the muscularis of the crop.

The occlusory tract, or valve of the previous literature, is formed posteriorly by a coalescence of the sepals in the following manner. As the calyx narrows, the sepals are brought closer together. Their wings shorten, the inner chitinous zone grows progressively thinner, and the outer zone expands toward the center, extending with it the filter area. Finally the inner zone disappears altogether; the sepals curve together and fuse medially. The filter area, seen in cross section of the sepal as a narrow zone separating the canal from the calyx cavity, has now elongated to form one of the filter slits of the occlusory tract (pl. 6, fig. B). The tract is thus a solid chitinous structure having in the center a single united cruciform slit, the arms of which are expanded at their tips into four canals, which are in turn continuous with the sepal canals in front and the bulb canals behind. It is of interest to note here that the arms of the cross are densely covered with chitinous hairs, whereas the canals are bare. The wall of the tract, external to the chitinous cross, is similar to that of the calyx. The longitudinal muscles are more concentrated due to convergence, and the external pairs of epithelioid cells are no longer evident.

The occlusory tract merges into the bulb by a thinning of the intercanal chitin and an expansion of the cruciform slit into the bulb cavity. The outstanding feature of the bulb is the powerful development of its circular muscles, which are five or more fibers thick in cross section.

EXPLANATION OF PLATE 7

Fig. A, cross section of the bulb at approximately the level of trans-section shown in plate 6. Fig. B, cross section of the cylinder. Fig. C, cross section of the cylinder at the level of the cylinder valve. M. g. epth., midgut epithelium. (360X)