

and the colored filaments are thus brought into sharp contrast, and the latter may easily be recognized under a sufficiently high power. Sections so prepared may be placed in 25 p. c. glycerine for future examination. For permanent mounts, glycerine jelly should be used. Balsam will answer for exhibition of continuity in the bast tissue, and will even preserve it for several months in the softer tissues, but in the latter case, the protoplasmic filaments gradually break up, and ultimately disappear.

I.—*CUCURBITA MAXIMA* AND *PEPO*.

HISTOLOGY.—The tendrils of the squash externally present the form of long, slender filaments, well rounded, but with a somewhat greater transverse than vertical diameter, and on the upper side flattened and slightly grooved for almost their entire length. The surface is generally smooth, though soft scattering hairs usually appear towards the upper side. The prevailing color is a very pale or whitish green, due to the deeply seated chlorophyll-bearing layer, which is internal to the collenchyma. This pale hue, however, is found to be interrupted along three lines, extending from base to tip of the tendril, in which the color is a strongly marked green, thus bringing these bands into strong prominence by contrast with the surrounding and lighter parts. These three lines or bands of tissue, always occupy the same positions, which are found to be, one on each side, just at the horizon of the major axis of transverse section, and the third in the position of the channel along the upper side of the arm, at the upper extremity of the minor axis. Aside from their more special value in circumnutation, these bands serve as most valuable means of noting certain changes incident to movement, e. g. those of torsion. The tip of the tendril is invariably turned slightly backward, or towards the lower side of the tendril arm, though during certain phases of the circumnutation, changes due to torsion often cause it to point upward.

Internally, the tendril presents several important features. Transverse sections disclose the form and relation of parts shown in Plate IV, Fig. 1. From this, the following details may be gathered :—

The epidermis consists of a single row of cells, which are either of the same size in both directions, or somewhat elongated in a direction perpendicular to the general surface. The epidermal hairs, so far as they may be present, are confined almost wholly to the upper and lateral surfaces at *b*, being absent from the surface below the horizon of the major axis *b'*. The hypodermal tissue consists of a rather thick layer of collenchyma (*bb'*), which is almost continuous throughout the entire circumference of the tendril, its continuity being interrupted in the three regions *a*, *a'*, and an opposite to *a'*. These areas of interruption correspond to the three green bands already referred to. The collenchyma itself is thus separated into three distinct bands, which traverse the tendril throughout its entire length, one being larger and inferior in position at *b'*, and two smaller and superior as at *b* and its corresponding part on the other side. The first is usually distinguished by being somewhat thicker, and also of much greater lateral extent than the other two combined. The detailed structure of this tissue is shown in Fig. 3, from which it appears that the collenchymatous thickening is somewhat general over the entire surface of each cell.