

( $b^1$ ) to a considerable distance beyond. The circulation of the chymiferous fluid is very active in this part of the hydrarium, and there seems to be an unusual amount of granular matter brought to these parts. The hydra (*Fig. 4*) is developed by an expanding terminal growth of the pedicel. The outer ( $a$ ) and inner ( $b$ ) walls have the same characteristics as those of the growing stem (*Fig. 3*,  $a^1$ ,  $b^1$ ), and, as in the latter, the cells are arranged transversely to the thickness of the walls, and in a single layer. The cells of the outer wall (*Figs. 3* and *4*,  $a$ ,  $a^1$ ) are much more slender and transparent than those of the inner wall; they are prismatic and sharply angular (*Fig. 4<sup>a</sup>*), and have an average transverse diameter of one five thousandth ( $\frac{1}{5000}$ ) of an inch. The cells of the inner wall (*Figs. 3*,  $b$ , and *4*,  $b$ ) are nearly twice as broad as those of the outer wall, and are much darker and have thicker walls. Their inner ends are thickly coated with ragged brown pigment cells, which are detached, from time to time, and carried away by the circulating fluid. After the calycle is complete, the broadest part of the top-shaped hydra becomes the seat of the development of a circle of papilliform protuberances (*Figs. 7* and *9*,  $l$ ), which are formed by the combined protrusion of the outer and inner walls. These rapidly grow into well-formed tentacles (*Fig. 8*,  $l$ ), but are confined in their extension by the calycle. The relative proportions, in thickness, between the outer and inner walls of the adult hydra, are assumed as fast as these walls are developed; so that they are comparable to those of the adult (compare *Figs. 7* and *5*,  $a$ ,  $b$ ) at the time the tentacles have begun to form (*Fig. 7*,  $l$ ). Just before the hydra issues from its retreat for the first time, it retracts from the parietes of the calycle, and offers a better view of the structure of the latter, especially of the margin (*Fig. 8*,  $c^6$ ,  $c^7$ ) and the opercle ( $d$ ). The margin is identical in form with that of the older adults, and rather more distinctly polygonal. The opercle ( $d$ ) does not meet edge to edge with that of the calycle, but its rim is bent, at a sharp angle, inwardly, and forms a narrow transverse shelf ( $d^1$ ). A very noticeable feature in the outer wall of the stem and pedicels is the enormous development of lasso-cells, which make their appearance just in proportion as the cells of the growing wall become obscure (compare *Figs. 3* and *4*). In the adult they roughen the wall like the teeth of a farrier's file (*Fig. 13*,  $a^1$ ).