

developing under natural conditions, accurately describes those grown in the laboratory. A somewhat spherical mass composed of sixteen cells results from the segmentation of the spore, then the first indication of a permanent holdfast appears as a slight projection of each of the four basal cells. The primary root-cells, dividing at right angles to their longest axis, form two-celled filaments, which branch monopodially and give rise to a broad spreading holdfast. In section the mature holdfast appears parenchymatous (*Pl. XXI, figs. 17, 18*), but it is often possible to distinguish the component filaments (*Pl. XXI, fig. 20*). Exceptional plantlets produce one instead of four primary root-cells, but the later stages conform to the type (*Pl. XXI, fig. 19*). In all cases the cells of the holdfast are paler than those of the frond, and the chromatophores of young specimens are in close contact with the walls.

From the foregoing it will be seen that *Rhabdonia*, *Lomentaria*, and *Champia* agree (*a*) in passing through a segmentation stage, resulting in a somewhat spherical mass of cells, (*b*) in the elongation of four basal cells, and (*c*) in the subsequent development of four primary rhizoids, which branch repeatedly and finally form a large discoid holdfast, composed of pseudo-parenchymatous tissue.

In marked contrast are several members of the Rhodome laceæ. The spores of *Chondria tenuissima* (Good. et Wood.) C. Ag. and of *Chondria dasyphila* Ag. germinate very readily. The early divisions of the spores and the history of the development of the rhizoids are alike in the two species. The spores, which are large and have coarsely granular contents, quickly and firmly attach themselves to the substratum, doubtless by means of a thin and uniform layer of mucilage, though no secretion distinct from the cell-wall is perceptible (*Pl. XXI, fig. 23*). They soon divide into two unequal cells separated by a slightly concave wall; divisions parallel to the first follow (*Pl. XXI, fig. 24*), and the basal cell of the resulting filament elongates into the primary rhizoid (*Pl. XXI, figs. 25, 27*). Sometimes the basal cell seems to branch dichotomously; but, as the branches do not