

spore develops, the first rhizoid pierces the disk, which then becomes disintegrated and finally disappears (*Pl. XXIII, fig. 26*).

After attaching itself in the manner described, the spore elongates and divides several times in parallel planes at right angles to its longer axis (*Pl. XXIII, figs. 11-13*). The basal cell, growing rapidly, produces a multicellular rhizoid at an early age; but large plantlets, which have already cut off corticating cells, occasionally show little or no tendency to form rhizoids (*Pl. XXIII, figs. 14, 15, 18*). The primary root-cell branches into several rhizoids, which are increased in number by outgrowths from the cell adjoining the first root-cell (*Pl. XXIII, figs. 17, 19, 20, 27*). Still later, the cortications near the base of the plantlet develop multicellular branching rhizoids of great length. All remain free throughout the life of the plant, and both primary and secondary rhizoids branch monopodially near the tip, and thus give rise to large multicellular disks of irregular outline (*Pl. XXIII, figs. 13, 22, 26, 28*). These indented clasping-disks are closely crowded together, cohering so as to form a large rounded holdfast, in which the various elements may be clearly distinguished. As both of the species are upright in habit, no secondary holdfasts are developed at any point of the mature frond. As in several other genera, the chromatophores of the plantlets and of the holdfasts resemble those of the corticating cells rather than those of the central axis, the former being disks, the latter irregular branching bands (*Pl. XXIII, figs. 17 and 21*).

It is evident, therefore, that the species of the Ceramiaceæ examined differ greatly both in the manner of development and the form of the holdfast, agreeing only in the production of one primary root-cell. *Spermothamnion Turneri* forms at various points short unicellular rhizoids with terminal disks, branching does not occur, and cortications are not developed. *Griffithsia Bornetiana* produces a large spreading holdfast composed entirely of a pseudo-parenchymatous tissue arising from the primary root-cell. *Callithamnion*, *Spyridia*, and *Ceramium* have primary