variations are most important factors in the life and distribution of marine algæ, but a comparison of many cultures of the same species indicates that differences in the conditions which prevailed in the laboratory affected neither the form nor the order of development of the plantlet. It was difficult to keep the young plants healthy for more than three or four weeks; and during a few days of intense heat, in August 1896, all ceased to grow, were attacked by bacteria, and finally died.

Both carpospores and tetraspores were germinated and most closely resembled one another in their development. In some cases, however, tetraspores attached themselves to the substratum less readily than carpospores. This is regarded by Brannon (2) as an adaptation to the immediate distribution of the species.

Every day, slides upon which spores were growing were examined and drawings of living plantlets were made. Permanent mounts for comparative study were prepared at regular intervals and mature holdfasts were preserved in alcohol or in 5 per cent. formalin in sea-water.

The species selected for investigation belonged to the Rhodymeniales, with the exception of one member of the Rhodophyllidaceæ, *Rhabdonia tenera* J. Ag. The carpospores of this alga attach themselves firmly to the slides in nine hours; a very delicate outer layer, probably of mucilage, may be observed, but can hardly be distinguished from the cell-wall (*Pl. XXI, fig. 1*). In a few cases, an irregular layer of a coarsely granular substance surrounded the plantlets, and in one, a thick mucilaginous disk was developed at the base; these appearances were most exceptional, and were doubtless due to slightly abnormal conditions (*Pl. XXI, figs. 7, 8*). After attaching themselves, the spores immediately enter upon a segmentation stage, and within twenty-two hours two divisions are made. The first separates the spore by means of a vertical wall into two equal cells (*Pl. XXI, figs. 2, 3*). Three and four-celled stages result from the successive division of the two primary cells in vertical planes at right angles to the first wall; other cells are cut off from these by oblique walls, and thus an irregular spherical mass is formed.