



## NOTES ON THE DEVELOPMENT OF THE HOLDFASTS OF CERTAIN FLORIDEÆ.

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(WITH PLATES XXI-XXIII AND FIVE TEXT-FIGURES)

WITH the exception of passing references in various works, two articles, the one by Borge (1), the other by Strömfelt (8), include, I believe, all that has been written upon the holdfasts of the algæ. The former deals with a few members of the Chlorophyceæ; the latter is very comprehensive, but it is without illustrations and gives no specific details. Therefore, the study of the development of the holdfasts of some nearly related species of the Rhodophyceæ has seemed advisable.

The observations described in this paper were made at the Marine Biological Laboratory, Woods Hole, Mass., during the summers of 1896 and 1897, and the work was finished in the Botanical Laboratory of McGill College.

Cultures of the spores of several species were made under various conditions. Ordinary glass object-slides were placed in flat porcelain dishes; either white or painted black. The vessels were filled with filtered sea-water and in them were laid plants bearing ripe spores. The spores usually sowed themselves in twenty-four hours, in which case the plants were removed. Some of the dishes were fed by a gentle stream of running water, others were disturbed only three times a day, when the water was drawn off by a siphon and replaced by filtered sea-water. The latter method proved much the better of the two.

The color of the background had no effect upon the development of the spores, nor were the plantlets heliotropic. Cultures kept in a shaded place flourished best, even a short exposure to direct sunlight killing plantlets. It is to be regretted that no record of variations in the temperature and the density of the water was kept. Oltmanns (6) has conclusively shown that such

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