stamens or petals, but do have much thickened, cutinized walls on the surface cells of the outer side of the blade. No trace was found in the male flower of the rudimentary carpels mentioned by Dammer. The very short internodes of the female spike, with the thickening up of the decussate pairs of ovaries, results in a fleshy, green, compound fruit looking a bit like that of an *Opuntia* or like the tuber of a potato. There is a transverse layer of cambium-like tissue in the style to which its elongation is evidently due. Some details of the development of the embryo-sac and seed have been reported elsewhere. At germination the soft pericarp decays while the highly differentiated tissue of the endocarp is burst by the swelling embryo. The latter, since its radicle points toward the axis of the spike, has also to push through the tough fruits of the opposite side of the spike. Seedlings have been raised to 3 years of age in the greenhouse in Baltimore without showing any signs of flowering. The presence and characters of the structures described should help greatly in determining the relationship of this monotypic Order, which, for a century, has been tossed from branch to branch of the phylogenetic tree.

THE STUDY OF ALGAE AT MOUNT DESERT ISLAND, 1933

HELEN E. HUBBARD, *Phoenix Junior College*

The work done in the summer of 1933, under the direction of Doctor Duncan S. Johnson, was for the purpose of studying the marine algae at Mount Desert Island. Much time was spent in collecting and preserving material for the study of the life history of various species of both red and brown algae. Especial attention was paid to the development of Chorda filum. The results obtained are preliminary and will be reported after further studies are completed.

A STUDY OF THE LIFE HISTORY OF *AGARUM TURNERI*, THE SEA COLANDER

W. R. HATCH, *Johns Hopkins University*

The gametophytes of *Agarum Turneri* have not heretofore been described.

This plant occurring only in the lowest tidepools was collected from Sea Wall, Seal Cove, Otter Cliffs, Schoodic Point and in the channel off Long Porcupine. In the great tidepools on Schoodic Point attached plants were discovered growing in abundance, but the finest stands of this kelp—to judge from dredging—were found in 20-50 feet of water on the shelving ledges that lie along the north shore of Long Porcupine.

Although believed to fruit only in the fall and winter months, little difficulty was experienced in collecting fruiting material. The sporangia in association with paraphyses comprise the sori which form irregular patches over the surface of the perforate blade.

In the laboratory discharge of the sporangia was induced and cultures were made in order to study the germination of the zoospores. Gametophytes thus obtained were followed in the course of their

development to a 5-celled stage. The cultures, however, had to be abandoned before the production of antheridia and oogonia could be demonstrated. Satisfactory methods were worked out for the culture of the gametophytes, which should lead to results quite promptly when this study can be resumed.

NOTE ON THE BEHAVIOR OF THE BARNACLE

J. B. ALLISON AND WILLIAM H. COLE, *Rutgers University*

Attempts to use the barnacle, *Balanus balanoides,* for studies on stimulation during the summer of 1933 were unsuccessful due to the almost continuous irregularity of the cirral movements. Previous work has shown that irregularity is caused by mild stimulating agents in the sea water, and that some substances are very effective in extremely low concentrations. Similar irregularity has been encountered in past years at certain times during the summer, especially after the middle of August, but it has never continued for more than a week or two. Preliminary experiments designed to identify the causes of the irregularity clearly showed that some constituent of the sea water was responsible. Shaking the water with charcoal and filtering through paper resulted in a marked improvement of the cirral movements. Filtering through paper only gave a temporary improvement which was just noticeable. These and other experiments seem to indicate that the factor responsible for irregularity is some substance in solution in the sea water, perhaps contributed by the disintegration of micro-organisms. Systematic studies on the fluctuations of the micro-organic population, of the hydrogen ion concentration, of the specific gravity and of the chemical composition of the sea water correlated with the behavior of the barnacle will be necessary before the problem can be solved.

STUDIES ON STIMULATION BY HYDROCHLORIC, SULFURIC AND NITRIC ACIDS AND THEIR SODIUM SALTS IN *FUNDULUS**

J. B. ALLISON AND WILLIAM H. COLE, *Rutgers University*

The investigation of chemical stimulation in aquatic organisms was continued during the summer of 1933 by testing the stimulating efficiencies of hydrochloric, sulfuric and nitric acids, and the corresponding sodium salts in *Fundulus heteroclitus.* The experimental procedure was the same as that described in previous reports. The temperature was 17.6 $\pm$ 0.2°C. Each solution was tested 10 times on each of two fish. The hydrogen ion concentrations of the solutions

* A correction should be made to the research summary on stimulation of Fundulus by hydrochloric acid and by fatty acids published on page 30 in the 1933 report. The sentence, beginning on line 11 of paragraph 1 should read: "To give a reaction time of approximately 10 seconds, the following hydrogen ion concentrations were necessary for each acid: caproic, 1.123×10^{-1}; heptylic, 2.188×10^{-1}; valeric, 2.692×10^{-1}; butyric 6.457×10^{-1}; propionic, 8.318×10^{-1}; acetic, 11.23×10^{-1}; formic and hydrochloric, 15.15×10^{-1}."