sound-producing mechanism of the longhorn sculpin is actuated by contractions of the deep cranioclavicular muscles on both sides. The resulting periodic movements of the pectoral girdle are believed to produce the actual sound vibrations of the surrounding medium. The previously suggested source of the vibrations, pectoral-pelvic girdle stridulation (*2*), was disproved by amputating the pelvic girdle, without injury to the pectoral girdle, in three specimens. For more than 24 hours after the operation, all three fish readily produced apparently normal sounds. In the absence of antagonistic muscles for the production of a reciprocating movement, it is suggested that the deep muscles produce unidirectional movement and that the return movement is produced by the elastic nature of the pectoral-girdle articulations.

Further analysis of the sculpin sound-producing mechanism is in progress. The preliminary results from this species suggest that analogous electrophysiological techniques may assist in providing positive identification of unknown-sound-making structures in other species.

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Some Effects of Specific Organic Compounds on Marine Organisms

In recent years it has become increasingly recognized that sea water contains organic compounds in solution or suspension which may have definite roles in the living processes of marine organisms (*1–3*). Thus it is reasonable to expect that a number of vitamins that may affect the bioeconomy of the sea are produced naturally (*4*).

This report describes two cases of interest which have come from our studies of the organic components of sea water. These results are considered to be significant because the presence of one of the compounds has been demonstrated by chemical methods (*2*) and because the other could easily be presumed to be present. In addition, both components showed definite physiological effects on the animals used.

Table 1. Effect of niacinamide on the pumping rate of an individual oyster.

Niacinamide (ppm)	Reduction in pumping rate (%)
0.42	52
0.83	83
2.08	99
3.33	99
10.00	100
50.00	100

During the experimental work of Collier *et al.*, various organic compounds were introduced into the water supply of experimental oysters [*Crassostrea virginica* (Gmelin)] in an attempt to obtain a response similar to that caused by the natural carbohydratelike substances (*5*). Niacinamide was among these, and although it did not cause an increase in pumping rate, its effect was pronounced and quantitative in nature. The effect was easily repeated from oyster to oyster under a variety of conditions. Briefly, the maximum effect was to cause an immediate increase in the gape (openness of the valves) of the oyster and, simultaneously, a complete cessation of pumping. The niacinamide was introduced into the water-circulating system in various concentrations. Table 1 summarizes the results of a series of experiments on a single oyster. The shell movement is difficult to quantitate, but, as the pumping rate decreased, the gape of the oyster gradually increased and, simultaneously, the adductor muscle lost tonus.

These data are typical, and it can be seen that the pumping rate was inversely related to the concentration of niacinamide. Some points to be noted are (i) that the substance was not acting as an irritant in the normal sense, because an irritant normally causes an oyster to snap shut or show frenetic shell movements, as compared with the quasi-narcosis in this case; (ii) that the valves could be pressed to the closed position but would immediately return to full gape; (iii) that the maximum gape caused by the niacinamide was actually about 10 percent greater than that associated with normal maximum pumping; (iv) that, as the niacinamide was gradually removed by dilution with normal, running sea water, the activity of the oyster resumed the level prevailing before the introduction of the vitamin; and (v) that niacin caused no response in similar concentrations.

Our work on the natural organic compounds in sea water is continuing and further tests with specific organic compounds are under way.

Of a series of compounds used with barnacles, ascorbic acid caused the most clear-cut response. When the barnacles (*Balanus* sp.) were exposed to a maximum concentration of 0.014 mg of ascorbic acid per liter, they immediately initiated copulating activities. The cirri ceased beating, and the penis emerged, unrolled, and sought out nearby barnacles. The ascorbic acid was introduced at one point, and because it was carried through the remainder of the 25-gal tank by convection drifts, all of the barnacles responded in the same manner. This would indicate that they were sensitive to much less than the original concentration. The experiment could be repeated at will with the same results, and changes in *p*H that were caused by adding HCl in place of ascorbic acid did not stimulate the response. The barnacles were fully grown animals that had been reared from larvae in the aquarium where the experiments were performed. These tests were made when the barnacles were 38 days old.

For comparison, glutamate, glycogen, methionine, and inositol were also used and seemed to stimulate a more rapid beat of the cirri. Fish autolysate appeared to depress the rate. None of these caused the responses noted for ascorbic acid.

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Detection of Tumor-Inducing Factors in Drosophila

Many investigations have been concerned with the occurrence of melanotic tumors in *Drosophila melanogaster*. The effects of environmental modifications—that is, nutrition (*1*), temperature (*2*), and x-radiation (*3*)—on tumor incidence in various strains have been extensively studied. Melanotic tumors have been