is slightly acid. So far this particular difficulty has not been overcome, and the effect of thyroxin on the vital activities of Paramecium remains uncertain. It is to be hoped that future workers in the field will identify the species with which they work, and that this note will serve to correct an erroneous identification by the writer.

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THE SMELT IN LAKE MICHIGAN[1]

ATTENTION has been called to the fact that the smelt (*Osmerus mordax*) originally introduced in 1912 into Crystal Lake, Michigan, from Green Lake, Maine, has spread to Lake Michigan.[2] The first specimen came from off Frankfort in 1925, and others have been identified since, coming from Big Bay de Noc, Delta County, and Charlevoix, Michigan. Increase in numbers has been noted each year and unverified reports of its capture have come from other North Michigan ports as far as the Straits of Mackinac.

The first specimen collected from Lake Michigan had a stomach content consisting of a young specimen of the Lake-herring (or of some other species of the whitefish family) and crustaceans (*Mysis oculata*), which caused some apprehension since the smelt in the shallow waters (12–20 ft.) of Crystal Lake eat large numbers of small fishes, mostly *Notropis atherinoides*.

This was enhanced by the writer's discovery that the yearling smelt from Howe Lake (Lake Superior watershed) were at this small size feeding almost entirely upon their own young and the young of perch (*Perca flavescens*).[3]

In the spring of 1928 ten smelt were collected from Lake Michigan from water twenty to twenty-five fathoms deep off Empire, Michigan. They were mouthed in the large-meshed gill nets of the commercial fishermen which were taking nearly all whitefish and a very few lake trout. Their stomachs were entirely filled with *Mysis oculata*. The fact that the smelt can exist upon such a diet when in deep water further emphasizes the fact that this fish can range throughout the Great Lakes and seems destined to become one of the most abundant fishes of these lakes. In the deeper waters of Crystal Lake the smelt likewise feeds mostly upon *Pontoporea affinis* and *Mysis oculata* in contrast to its extensive fish diet in the shallow water. The smelt is therefore an enemy of all smaller fishes, including the young of the commercial species, as well as a competitor for the food of the adults of the larger species. The abundance of food, however, renders this competition less important.

A study of the growth of these smelt as determined from their scales after the standard method[4] and based on an unpublished fish-length, scale-length curve computed from a large series of smelt from Crystal Lake gave these average lengths: 88.7 mm for the first year; 149.3 mm for the second year, and 168 mm for the third year. Crystal Lake smelt averaged 92 mm in length for the first year; 156.9 mm for the second, and 171 mm for the third. Nine of the specimens were three years old and one two years old.

The three-year-old fishes were the most abundant size collected in the spawning run at Crystal Lake in 1923 according to the final determination, rather than the two-year-old size as preliminarily reported.

It is to be regretted that the smelt has become inexorably established in waters where it can not be limited or controlled. There is little chance to utilize it commercially except at the developed spring spawning runs and with ice lines in a few favorable locations. Gill nets of small mesh are impracticable because of their capture of a large number of immature commercial fishes.

This establishment of the smelt is another instance emphasizing the need for very close control of all experiments in the introduction of any kind of animal into a new location. Even with a very thorough knowledge of the life-history of a fish in its native waters little can be predicted as to the place it will assume in the readjustment to the new environment. Careful control, therefore, during such experiments is an imperative matter.

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[1] Contribution from the University of Michigan Biological Station and the College of the City of Detroit.

[2] C. W. Creaser, "The Establishment of the Atlantic Smelt in the Upper Waters of the Great Lakes," Paper Mich. Acad. Sci. V.: 405–424, 1925.

[3] C. W. Creaser, "The Food of Yearling Smelt," Paper Mich. Acad. Sci. VIII, 1928.

[4] C. W. Creaser, "The Structure and Growth of the Scales of Fishes, etc.," Univ. of Mich., Museum Miscellaneous Pub., No. 17, 1926.

QUOTATIONS

HUMPHRY DAVY

SIR HUMPHRY DAVY, who died one hundred years ago, was one of three men—Thomas Young and Michael Faraday being the other two—who by sheer force of native intuition made the Royal Institution, and with it this country, an unsurpassed center of scientific light and leading in the earlier part of last century. He was little more than a boy when he was drawing crowds to hear his lectures and witness his experiments. Before he was thirty he had won a European reputation by investigations which give him