

known to occur in the bay, one of them very abundantly; but as these have only two fins on the back while the cod has three, it will be easy to distinguish them; young pollock, too, can be at once distinguished from cod by the long lower jaw, which protrudes far beyond the upper, even when the mouth is closed.—EDITOR.]

ON THE INSENSIBILITY OF THE GERMAN CARP TO FREEZING.

BY DR. GEORGE WIGG.

[Extract from a letter to Prof. Spencer F. Baird.]

I have a German carp in my office frozen stiff six times in one month, yet each time after six hours came out all right; am going to put him into a tub in the garden.

CLAY CENTER, Mo., *March 23, 1882.*

FIRST ARRIVAL OF MACKEREL IN NEW YORK IN THE SPRING OF 1882.

BY CAPT. J. W. COLLINS.

[Letter to Prof. Spencer F. Baird.]

Mr. W. A. Wilcox, writing from Boston, under date of April 1, says: "The first new mackerel arrived in New York this afternoon. Schooner Nettie Rowe—new vessel from Gloucester—brings in fifty barrels; all large fine fish."

AN INQUIRY INTO THE FIRST FOOD OF YOUNG LAKE WHITE-FISH (*Coregonus clupeiformis*)

BY PROF. S. A. FORBES.

[A letter to Prof. Spencer F. Baird.]

I write only to inform you of the successful conclusions of a final experiment relating to the first food of the lake whitefish. I kept several thousand in a tank in the Exposition Building in Chicago, and kept them constantly supplied, for two weeks, with everything that a towing-net of very fine Swiss would take from the water of the lake. A hundred specimens were put into alcohol every two days, and finally all remaining were similarly preserved. During the latter part of the time they could be easily seen pursuing and catching the entomostraca. I have not time at present to examine the fishes preserved, as I am busy with other work. I have just searched the intestines of ten, taken out March 23, to get at some idea of the result of the experiment. Taking them at

random, opening the intestines under the microscope, and preserving the contents either as microscope slides or in capillary vials, I found that these ten specimens had eaten twenty-four entomostraca, all belonging to two species, descriptions of which I have in press, viz: *Cyclops thomasi* and *Diaptomus sicilis*—fourteen of the first and ten of the second.

Besides these I found only a few diatoms (*bacillaria*) in two of the fishes; a little fragment of a filament of an alga in one, and three rotifers (*Anurca striata*) in another.

I will prepare a full account of the experiment, with a description of the developmental conditions of the fishes when they commenced to eat, and a full analysis of their food, as soon as I have time to do the work.

I am indebted to Mr. Clark for the specimens; to the Chicago Exposition Company for the use of the tank, and to the State of Illinois for the expenses of the experiment.

ILLINOIS STATE LABORATORY OF NATURAL HISTORY,

Normal, Ill., March 27, 1882.

NOTES ON THE BREEDING, FOOD, AND GREEN COLOR OF THE OYSTER.

By JOHN A. RYDER.

No mollusk known to the naturalists, it appears, is consumed in such vast quantities as our native oyster, the *Ostrea virginica* of Gmelin; hence its great economic importance and the scientific interest which it has recently awakened. It is vastly superior in flavor, size, and vigor of growth to the oyster of Europe, and is simulated and approached only by one old Continental form which I have seen, probably the *Ostrea rostralis* of Lamarek. The first attempt made in the artificial impregnation of the eggs of this noble mollusk was successful in the hands of our countryman, Prof. W. K. Brooks, of Johns Hopkins University, of Baltimore, who, in 1880, published a remarkable memoir on the subject in the annual report of Maj. T. B. Ferguson, one of the fish commissioners of Maryland. Professor Brooks' triumph was not, however, as complete as might have been desired, since his investigations have not yet led to the development of methods whereby the oyster could be propagated by purely artificial means, but his success was so far beyond what was attained by Dr. Davaine in his attempts at the artificial fertilization of the European oyster in 1851, that Brooks' achievement marks the most important era in the history of the subject. Others, as well as the writer, have repeated his experiments with more or less success, and the latter has been able to work out a portion of the developmental history of *Mya arenaria*, clam or mananose, using artificially impregnated eggs for the purpose, which were dealt with the same as those of the oyster.

An earnest, and, it is to be hoped, successful effort is being made by