

## ON THE FOOD OF YOUNG WHITEFISH (COREGONUS).

By S. A. FORBES.

[Letter to Prof. S. F. Baird.]

Please allow me to add to the facts relating to the first food of the whitefish, detailed in my letter of last spring, the following notes from recent observations:

According to an arrangement made with Mr. Frank N. Clarke, I went to Racine, Wis., on the 16th instant, in order to search the lake for minute animal life at the place where it was proposed to plant a lot of young whitefish. Mr. Clarke's party made better railroad connections than he expected when he telegraphed me, and the fish had been released about nine hours when I arrived. I took a boat as soon as possible, and made a careful search for entomostraca in the water of Racine River, near its mouth, and in the lake at various depths and distances from the shore.

The entomostraca occurring were all of species which I had previously collected off Chicago and in Grand Traverse Bay, viz, an undescribed cyclops (*C. Thomasi*, MSS.), an undescribed variety of *Diaptomus gracilis* Sars; a new species of centropages (especially interesting, since the genus has been hitherto unknown only from salt water); and *Daphne galeata*? Sars.

The cyclops and diaptomus were about equally abundant, but the centropages and daphnia were much less common. All were much more abundant in the rivers than in the lake, and in the latter were more numerous at or near the bottom than at the surface. This was perhaps owing to the cool and lowering weather. Immense numbers of diatoms lined the towing net after every haul, with a brownish, mucilaginous coating, the vegetable life far surpassing the animal in quantity.

I dragged the towing net as nearly as possible a quarter of a mile at each haul, and saved each time the entire contents of the net. Taking a definite part of the product of the most fruitful haul and counting the entomostraca in this, I reached the conclusion that they occurred here at the rate of two or three to the cubic foot of water, or, taking favorable and unfavorable situations together, at about one or two to the foot; this suggests the propriety of scattering the deposit of fish as much as possible, unless it is certain that they scatter rapidly when left to themselves. It should be noted that the most abundant species here at this season of the year were, fortunately, the smallest. Mr. Clarke kindly gave me a few young fishes left in one of the cans, and I succeeded in getting about twenty-five of them home alive.

I put these in a small aquarium with well-water on the 17th and supplied them with entomostraca and algae of various kinds from the pools

of this vicinity. The entomostraca were chiefly large cladocera (*Simocephalas*), cyclops, and canthocamptus. To the algæ, the little fishes have paid no attention whatever, although they are well scattered through the water. They have followed the smaller entomostraca around with growing interest from the first, occasionally making irresolute efforts to capture them, but did not actually begin eating until to-day. Now, however, more than one-half of them have evidently taken food. In the seven cases examined, this consisted entirely of cyclops and canthocamptus, the smallest entomostaca in the water. The cladocera are evidently too large for them, and they even seem afraid of them, although, of course, the former could do them no harm.

The fishes all have visible remains of the egg within the body, but, as their teeth are already well developed, they are doubtless at the proper age to commence eating. This seems to me nearly conclusive proof, taken with my previous observations, that the first natural food of the whitefish is small entomostraca, especially cyclops (*Canthocamptus* occurs rarely, if at all, in Lake Michigan), but it may be worth while to repeat my little experiment on a larger scale and under more natural conditions.

I have consequently taken steps to study a number of specimens kept in the water of the lake and supplied with the organisms occurring in the lake waters.

It will be impossible for me to keep alive the few which I have, long enough to tell how well they would flourish on the food supplied to them.

ILLINOIS STATE LABORATORY OF NATURAL HISTORY,  
Normal, Ill., February 20, 1882.

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**SOME RESULTS OF THE ARTIFICIAL PROPAGATION OF MAINE AND CALIFORNIA SALMON IN NEW ENGLAND, AND CANADA, RECORDED IN THE YEARS 1879 AND 1880.**

[Compiled by the United States Fish Commissioner.]

NEW BEDFORD, MASS., May 20, 1879.

Prof. S. F. BAIRD:

SIR: I have just been in the fish market and a crew were bringing in their fish from one of the "traps." A noticeable and peculiar feature of the fishery this year is the great numbers of young salmon caught, especially at the Vineyard, although some few are caught daily at *Sconticut Neck* (mouth of our river). There are apparently two different ages of them. Mostly about 2 pounds in weight (about as long as a large mackerel) and about one-half as many weighing from 6 to 8 pounds; occasionally one larger. One last week weighed 23 pounds and one 18 pounds. The fishermen think they are the young of those with which some of our rivers have been stocked, as nothing of the kind has occurred in past years at all like this.

JOHN H. THOMSON.