

*Hatchery Diseases*  
*Institute*  
*copy*

INSTITUTE FOR FISHERIES RESEARCH  
UNIVERSITY MUSEUMS  
UNIVERSITY OF MICHIGAN  
ANN ARBOR, MICHIGAN

September 3, 1930

Report No. 25

REPORT ON THE MOUTH DISEASE OF BROOK TROUT FINGERLINGS AT  
BENTON HARBOR STATE FISH HATCHERY

The hatchery was visited on August 14, 1930.

The disease broke out in pond "Number 11", the third of a series of four brook trout ponds fed by a spring stream from the De Temple Farm. Before we arrived many of the trout had been removed from the pond to the hatchery troughs at the suggestion of Mr. A. B. Cook. The fish had been treated with a weak solution of copper sulphate followed by salt treatment and no typical specimens of diseased fish were noted in the troughs. Some were dying as the result of fungus. Careful examination revealed the fact that the fingerlings were nipping each other and that the injured parts were attacked by fungus. As a result of this observation it was suggested that the fish be given a strong salt treatment and returned as soon as possible to the treated pond.

The pond had been treated with 150 pounds of air slacked lime. A considerable number of fish in the pond which could not be gotten on account of the abundance of vegetation stood the lime treatment and the loss due to the disease subsided.

At the time of our visit the pond above "Number 11" was affected with the disease and sufficient material was secured for examination.

The affected fish were slow and sluggish. They appeared to take food up to the time of death. In the latter stages many made an effort to maintain their

equilibrium but finally came to the surface. When these fish were observed in the pond the lesions could be seen as whitish streaks or spots about the mouth, but in more advanced stages they may be yellowish.

Fish showing the smallest possible lesions were secured for closer examination and it was found that in these specimens the disease was already far advanced but could not be observed at a distance because of the parts which were affected (mouth). In these specimens the tissues of the tongue were invariably attacked, the tissues around the teeth in the premaxillaries and mandible were destroyed. By pulling the premaxillaries from the maxillaries (mouth region) one found the thin membranes to be completely destroyed.

A number of specimens showing (macroscopically) the first indications of lesions were examined under the microscope and the disease was found to be well confined to the tongue and jaw regions. The tissues were necrotic and pulled away from around the teeth. Bones and teeth were not affected. Color in infections of short duration was whitish, becoming yellowish in the more advanced stages. A considerable amount of brownish color in far advanced stages seems to be associated with the addition of growths of various organisms in the dead tissue. Pinkish, bloody areas sometimes exist at the junction of the healthy and affected parts due to rupturing of blood vessels. This hemorrhage is usually found on the ventral side of the lower jaw or at the angle of the lower jaw.

In the very young lesions we found an almost pure culture of rod-shaped bacteria in enormous numbers. They are apparently non-motile and seem to have a rather characteristic mat-like arrangement. When examined in the living condition under relatively low magnification many were turned in such a way as to look silvery. Pieces of tissue were examined and were transparent enough to permit one to see the advance of the bacteria into the healthy tissue. This observation

strengthens the conclusion that the organism is intimately associated with the disease.

Two attempts to isolate the organisms by culturing on agar media have failed.

On our visit to Watersmeet State Hatchery on August 17, 1930, we found that they had had a considerable loss in a pond of brook trout but this loss had almost completely subsided at the time of our visit. We asked the caretaker of the pond whether or not he could obtain specimens which were typical of the disease. Three fish were secured which presented the same macroscopic appearance as the ones at Benton Harbor. Smears of all three specimens showed an organism morphologically identical with that found in the disease at Benton Harbor. Since pond conditions under which they were found were also quite similar, it is quite likely that the disease is the same.

At both stations the disease broke out in exceedingly hot weather during which record water temperatures were recorded and the disease subsided promptly when climatic conditions changed. The temperature seems to be the most important factor in bringing about the disease since this factor was the most constant of the environmental conditions. In both cases the ponds were abundantly supplied with algae. At Benton Harbor the water supply was low, the rate of flow through the pond slow and the growth of algae undisturbed. At Watersmeet there was an abundance of water, fast current and one man was kept busy keeping the screens free from the mats of algae being carried by the current. In both cases the ponds were in the open and a great deal of surface was exposed to the sun.

*Copies to Westerman  
Krull  
List.*

Wendell H. Krull  
Fish Pathologist

*Benton Harbor*

MICHIGAN DEPARTMENT OF CONSERVATION

INTEROFFICE COMMUNICATION

August 2, 1930.

Institute for Fisheries Research,  
University Museums,  
Ann Arbor, Mich.

Attn:- Mr. Krull.

Gentlemen:-

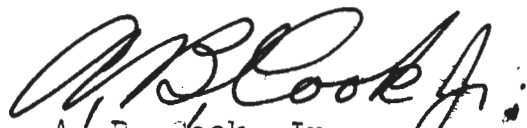
Mr. Walter Hughes, Overseer, State Fish Hatchery, Benton Harbor, has reported a loss of fish in one of his ponds which has continued to a point which might be considered dangerous. I visited the station yesterday and find that the infection is one which is entirely new to me. The bulk of the fish in the pond continue to feed and have made a very satisfactory growth. One notes that certain individuals seem to have some difficulty in maintaining their equilibrium in the water and upon close examination the presence of an infection about the mouth, from which considerable amount of yellow matter exudes, is noted.

I told Mr. Hughes to remove the fish from this pond and to place them in a few open troughs where they may be observed more readily and given more careful attention. He has also been instructed to carry on all of the conventional treatments in the manner prescribed by the Institute for Fisheries Research and Bureau of Fisheries with certain variations which you and I have discussed together. I have asked Mr. Hughes also to select certain specimens and have them forwarded to you at Ann Arbor.

It might be worth while for you to keep in touch with Mr. Hughes in connection with this matter and, if the infection does not adjust itself within a reasonable length of time, a visit from you would probably be very much worth while.

Very truly yours,

DEPARTMENT OF CONSERVATION



A. B. Cook, Jr.  
Field Supt., Fish Division

ABC/L

Millbury, Michigan  
August 14, 1935

Mr. Wilson,  
408 N. Third Street  
Ann Arbor Michigan

Dear Sir,

Since the first of August, my  
husband has been trying to see you with regard to the  
renting of the lower apartment at which we have been  
looking.

STATE OF MICHIGAN



DEPARTMENT OF CONSERVATION

LANSING

Benton Harbor

8/8/30.

GEORGE R. HOGARTH  
DIRECTOR

Institute for Fisheries Research,  
University Museum,  
Ann Arbor, Mich.

Gentlemen;

Under separate cover am sending some specimens taken from hatchery rearing ponds at the Benton Harbor State Fish Hatchery, which we think are diseased fish. On August 2nd, you received a letter from Mr. A. B. Cook Field Supt., Fish Division, Department of Conservation. In regard to this matter.

Very truly yours,

*Walter Hughes* Overseer,  
State Fish Hatchery,  
Benton Harbor, Mich.



DEPARTMENT OF CONSERVATION  
LANSING

Benton Harbor

9/15.1930.

L. J. YOUNG  
DIRECTOR

Mr. Wendell H. Krull,  
Fish Pathologist,  
Ann Arbor, Michigan.

Dear Mr. Krull;

Your letter of September 3rd received sometime ago. And feel very sorry in not answering before I went on my vacation. Am very much interested in the report you sent, and very grateful to you for your interest in the fish at this station. I am very much pleased to inform you that the fish started to feed just after you were here and are coming along just fine. By following your instructions. Thanking you very kindly,

I remain yours very truly,

*Walter Hughes* Overseer,  
Benton Harbor Station.