

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

Report No. 74

July 2, 1931

ON DISEASED BROWN TROUT RECEIVED FROM GRAYLING FISH HATCHERY

A shipment of twenty-one brown trout was received from Grayling on June 27, 1931. These fish, perfectly packed and in excellent condition for examination, ranged in length from 8 to 15" and were mostly females. The twenty-one fish were examined immediately after arrival.

These fish were some of a large number of brown trout which died in the hatchery ponds in the course of a few days. (Refer to letters from Mr. P. G. Zalsman to Department of Conservation, dated June 19 and 26, 1931).

No lesions were found in the skin or muscles. The fish were in a splendid physical condition and in most cases the stomach was full of food. Only three of the stomachs were opened but nothing abnormal was found in them. The food in the gut seemed to be normal and no gas formation existed in any part of the digestive system. This could have been given more careful attention had we known that food poisoning was suspected. We hardly think that they could have been given enough ordinary food to poison them and we doubt very much whether food scraps would hurt them. We know that the large trout in the spring at Wolf Lake a year ago were kept in splendid condition by the men working on the road who gave the fish all their food scraps. If the fish were poisoned by a "crank" with poisoned food, all of the fish in the pond would, no doubt, have died and the internal organs in the body cavity would not have shown the abnormalities which existed.

In every case the terminal two inches of the intestine was highly inflamed and the blood vessels congested. The spleen in all except one fish was black and in some it

was enlarged to three or four times the normal size. The liver in almost every fish was blotched. A general congestion of blood vessels existed throughout the cavity.

These are symptoms of furunculosis and if we have occasion to go to that part of the state we shall stop at Grayling and make cultures of the brown trout and yearling brook trout to get an idea of the abundance of the disease organism. The skin and muscle lesions do not always appear in this disease and from observations at Grayling during an epidemic of furunculosis the smaller number of these lesions in brown trout as compared with the brook was quite noticeable. We have recently received a large brown trout from natural waters which shows only two lesions.

Several unrelated quotations from Davis (1929) are interesting in this connection. He says concerning furunculosis:

"Among the trouts, the brown and brook trout are particularly susceptible. In this country serious mortality from the disease has apparently been confined to brown and brook trout in hatcheries and rearing ponds. The symptoms of the disease are usually, though not always well marked. According to Plehn, the disease may occur rarely in a quite different form, in which the causitive organism is found only in the cavity of the intestine, at least until a comparatively late stage of the disease. In such cases there are no external symptoms, and recent investigations indicate that in some instances the bacteria may live in the intestine for some time without any apparent injurious effects on the fish".

This is a recurrent condition at Grayling (Report No. 19). We have a note appended to our copy of report Number 19 in which it is stated that we learned from a conversation with Mr. Zalsman and Mr. Peterson that six dead large brown trout were taken from the river at the same time the mortality occurred in the ponds about a year ago.

Examination made and report prepared by Dr. Wendell H. Krull, Fish Pathologist.

INSTITUTE FOR FISHERIES RESEARCH
Carl L. Hubbs (by O.E.S.)
Carl L. Hubbs, Director

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Supplement to Report No. 74.

We visited the Grayling Fish Hatchery on July 3, 1931 and on our return to Ann Arbor found Mr. Zalsman's copy of his letter to the Department dated July 4, 1931 in which he states that the Hatchery Staff cannot agree with our findings as presented in Report No. 74. We appreciate and welcome a frank opinion, but since our visit to the hatchery we still think that furunculosis was the most probable cause of death.

Examination of a pond containing yearling brook trout showed dead and dying fish. Examination of these fish showed that more than half of them had surface lesions. Blood from three dying fish from this pond was ~~plate~~ plated on a culture medium in which colonies, morphologically and physiologically characteristic of furunculosis, were produced. Blood smears of the three fish showed bacteria.

The loss of brown trout discussed in report No. 74 occurred in the third or last pond of a series of three. The first two ponds of the series were occupied by adult brook trout and this was the arrangement when the heavy loss in the brown trout occurred. During our stay of a couple of hours at the hatchery two brook trout died in the second ^{pond} and each had several typical furunculosis lesions. Three brown trout died in the third pond while we were at the hatchery and one was well supplied with lesions of the same disease, one was a "black fish" and according to Horne (1928) this can be considered a symptom of the disease; the other fish appeared normal externally. As is well known, trout, affected seriously with furunculosis often show no external signs of the disease.

It is interesting to note that there was a brown trout with rainbow trout in an adjacent pond and when the heavy loss occurred in the brown trout pond this brown trout also died. This would seem almost mythical were it not for the fact

that we know something about the behavior of bacteria.

We wish to thank members of the Hatchery crew, who, in Mr. Zalsman's absence, aided us in this investigation.

cc. to Zalsman

INSTITUTE FOR FISHERIES

Wendell H. Krull
Wendell H. Krull
Fish Pathologist

MICHIGAN DEPARTMENT OF CONSERVATION

INTEROFFICE COMMUNICATION

Grayling, Mich. July 4th, 1931.

Dept of Conservation
Fish Division
Lansing, Mich.

Dear Sir:

Received report # 74 date July 2, 1931.

Subject Diseased Brown Trout,

By Dr. Carl L. Hubbs and Br. Wendell H Krull.

This report may be correct, and it is official,
but I am sorry to say, We, At this hatchery, can not agree
with them,

With best wishes, I am

Sincerely Yours,

Phil G. Zalsman. Overseer
Grayling. Fish Hatchery



C C Copy to Dr. Carl L. Hubbs.

MICHIGAN DEPARTMENT OF CONSERVATION

INTEROFFICE COMMUNICATION

Grayling. Mich. July 17, 1931.

Dept of Conservation
Fish Division
Lansing. Mich.

Dear Sir:

Supplement report No 74, Subject Brown Trout received. I am sorry I can not think the same as Dr. Krull, these 245 brown trout that died in about Six hours were all bloated when they died, and the 22 that I sent to Ann Arbor were all bloated when they were packed, I picked them up myself and packed them, and as the fish that die of furunculosis do not bloat, it is still a question to me in regards to their death, we opened about 20 and found all the stomach's the same, with some kind of substance that looked like cube pine-apple, which may have been fed by some tourist from the tourist camp, with no intention of doing any harm, and just as the fish were about to die they would bleach out in spots, No; I can not believe they died of furunculosis, it looked more like some kind of poison,

The fish Dr. Krull, examined on July 3rd, I understand was not in the same condition as those we sent to Ann Arbor, it may have died of furunculosis, and while we differ on this subject, I hope it is all friendly, but, as the old saying, I am from MISSOURI.

Sincerely Yours,

Phil G. Zalsman

Phil G. Zalsman. Overseer
Grayling Hatchery

C Copy to Dr. Krull
Ann Arbor

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August 1, 1931.

Mr. F. G. Zalsman, Overseer,
State Fish Hatchery,
Grayling, Mich.

Dear Sir:-

I have your letter of July 27th with further reference to the loss of brown trout at Grayling and your explanation as to cause of death seems a rather logical one, though it is hardly possible that these fish were infected with furunculosis as Dr. Krull's investigation revealed. Copper sulphate provided in excess of the amount needed would be liable to kill these fish and it will be interesting to note whether further losses occur in this connection.

Very truly yours,

DEPARTMENT OF CONSERVATION

F.A. Westerman
FISH DIVISION

PAW/U

MICHIGAN DEPARTMENT OF CONSERVATION

FISH DIVISION

INTEROFFICE COMMUNICATION

JUL 28 1931

Grayling. Mich. July 27, 1931.

Dept of Conservation
Fish Division
Lansing. Mich.

Dear Sir:

Yesterday July 26th we picked up 20 Brown Trout out of the same pond we picked up 245 some time ago, and I made a little closer examination of half of them, the stomachs were full and they were bloated, what I thought was perhaps cube pineapple was fat from hearts, and the cause of death I have come to the conclusion is poison from Copper-sulphate,

Saturday afternoon we Copper-sulphated the fingerling ponds, this solution goes through the ponds where the big fish are and the feeder was feeding these fish at the same time, this solution goes to the bottom of the pond, and so does the food, and if it lays there any length of time nodoubt will poison the food, and as the brown trout feed from the floor of the pond, and as there is some grass in this pond, where the food and Copper-sulphate can lay, I think later on, after through feeding, some of the brown trout picked up this food and died of the effect, and we did the same thing when we lost the 245,

When I ppened some of these fish I found traces of furunculosis, But, after going over conditions in eazh case of our loss in our Brown trout, I find that in each instance we were copper-sulphating during or directly after feedin the large fish, The Brown's being bottom feeders would pick up food that lodged in the ponds, which might have been poisoned from copper sulphate. and still it may have been furunculosis as per Dr. Krulls statement in bulletin # 74, will leave it with you.

We have not found any dead brown trout since yesterday morning, and we will be more carefull hereafter when we Copper and Feed fish

Sincerely Yours,

P. G. Zalsman

P. G. Zalsman. Overseer
State Fish Hatchery

C C to Dr. Krull.
Ann Arbor. Mich.