



INSTITUTE FOR FISHERIES RESEARCH
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ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS
ANN ARBOR, MICHIGAN

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Effect of 0.3 and 0.5 ppm. Solution of CuSO_4
on Brook Trout in Flint City Water

A. S. Hazzard*

Mr. C. H. Burdick, Chief Chemist for the Water Supply Division of the City of Flint asked the Institute for Fisheries Research to advise concerning the possible effect on trout present in Wheelock Lake of proposed treatment with CuSO_4 to reduce obnoxious algae in this source of city water.

Since the toxicity of copper sulphate varies greatly with the temperature and chemical content of the water, it was suggested that a supply of the water from Wheelock Lake be brought in for experiments. Accordingly Mr. Burdick supplied us with about 30 gallons of water from this source. Three earthenware churns holding about 10 gallons each were partly immersed in larger crocks through which city water was allowed to flow in order to maintain a low temperature during the experiment. Oxygen was furnished from the air line, being released through carborundum tips.

Solutions of 0.3 part per million and 0.5 part per million by weight of C. P. CuSO_4 were placed in two churns; the third churn containing only

* Dr. Carl L. Hubbs assisted the writer in setting up these experiments and in making observations during their course.

Wheelock Lake water was used as a control. Five brook trout varying from 105 to 144 mm. total length were placed in each churn after the water had been aerated for about four hours.

The experiment began at 7:55 p.m. on December 18, 1935 and was concluded at 3:30 p.m. December 21. All trout appeared to be in excellent condition at this time. It was observed that the water containing copper sulphate contained considerable mucous, presumably from the trout.

Water temperature in the churns during the experiment varied from 10.0° to 13° C. and was essentially the same in all three churns. This variation was due to the normal fluctuation in the temperature of the water circulating outside the containers.

Mr. Burdick supplied the following analysis of the water at the outlet of Wheelock Lake:

Alkalinity to methyl orange, 240; phenolphthalein, 8;
dissolved oxygen, 5.9; true color, 27; apparent color, 32;
p. H., 8.3. All the above results are in parts per
million.

It will be noted that this water would be classed as hard. During the treatment of Wheelock Lake, using from 0.3 to 0.5 ppm. of CuSO_4 , the surface temperature was close to freezing, as thin ice was reported in places along the shores. No loss of trout occurred as a result of using the copper sulphate.

It is concluded that at the temperature indicated and in water of the hardness of that from Wheelock Lake, solutions of 0.3 and of 0.5 parts per million of CuSO_4 are non-toxic to brook trout.

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By A. S. Hazzard
Director