

**212.—TWO HUNDRED TONS OF DEAD FISH, MOSTLY PERCH, AT LAKE MENDOTA, WISCONSIN.****By PHILO DUNNING and others.**

We take the liberty of addressing the United States Fish Commission upon a matter of some concern to this community, and do so upon the assurance of Dr. Philo R. Hoy, of Racine, and Governor Rusk, that the matter will receive favorable consideration.

Madison lies between two of a series of four lakes, the larger one of which is known as Fourth Lake, or Lake Mendota, and the smaller, Third Lake, or Lake Monona. The discharge of water is from Fourth Lake into Third Lake, and so on from Second to First Lakes to the Rock River. All of these lakes are well stocked with fish; perch, pickerel, white and black bass, whitefish, and some other varieties. The same families of fish are found in each lake.

About two weeks since, the perch of Fourth Lake commenced dying in all parts of the lake. As they came to the surface they were driven by the waves to the shore. Great numbers have been driven upon what may be called the city shore, becoming very offensive. Probably upon this shore a greater portion of fish have been driven than upon other parts of equal length of the shore of the lake. What we designate as the city shore is probably three-quarters of a mile in length, and its form, together with the prevailing winds, have tended to bring upon it a somewhat greater portion of the fish than have gone to the other portions. The city has had a force of men constantly employed in the work of burying the fish as they come in. The force has averaged from twelve to fourteen men with teams. On one day thirty-eight were employed. It is estimated by the street superintendent that he has buried in excess of a hundred tons, calling a wagon load with double sideboards a ton. The fish dying are mostly perch. Latterly quite a number of whitefish have been found with the perch and a few suckers and white bass, but no more of the varieties of fish other than perch and whitefish than we expect to find each year. The perch will average about a quarter or a third of a pound in weight. A day or two since some perch minnows were noticed to be dying. We are told that the dying continues up to this time. We are inclined to think that fully 100 tons have been buried, but we feel quite justified in saying that 75 tons have. The lake is from 6 to 8 miles long—8 at the greatest length—and from  $2\frac{1}{2}$  to 5 miles wide—5 at the greatest width. Assuming that twice or three times as many fish as have been buried lie upon other parts of the shore, the destruction of fish, chiefly perch, is fully 300 tons. Can you explain the cause?

Although the flow of water is from Fourth Lake into Third Lake, and so on, the fish in Third, Second, and First lakes are not as yet affected.

A small quantity of sewage (that is from a few private sewers) is discharged into Fourth Lake; also some chemicals from the laboratories of the State university, and also a little gas tar from the insane asylum gas works situated on the north side of the lake opposite the city. The sewage, waste chemicals, and tar are put into the lake at three points each remote from the other. But it is also true that a much larger amount of sewage is discharged into Third Lake, in volume not less than three or four times that which is discharged into Fourth Lake and as well as some gas tar.

Dr. Hoy was called here, and has made an examination of the fish. His report upon the same is to be sent to us later. He is also to write you upon the subject. Professor Birge, of the State university, is said to have made some examinations also, and is reported to have sent the results of his examination to you.

By express we send you a jar containing several of the fish taken just before death. We hope that your examination of these fish, with the aid of such suggestions as Dr. Hoy and Professor Birge may make, will put you in possession of the facts of the case sufficiently for an opinion as to the cause, and if possible enable you to suggest a remedy for this calamity. It were a calamity if it were merely the loss of the fish, but there may be in it also a threat of sickness to our people. In passing upon this matter will you be good enough to give your opinion upon the significance of this as threatening sickness.

It may be proper to state that various suggestions have been made as to the cause of this trouble. One is that a small worm attacks the gills or throat of the fish; a worm is said to have been taken from a weed upon which the fish had been feeding, the weed being found to some extent in the intestines of the fish. Another is, that it is caused by a parasite feeding upon the gills. Dr. Hoy undertook to analyze the water of the lake, and reports it nearly as pure as the artesian water with which the city is supplied.

It is also said that in years past the fish of this lake in considerable numbers have died. Every year there are some dead fish. In or about 1844 the whitefish came ashore in quantities as great as the perch now, and on several occasions fish in considerable numbers have come ashore. (Philo Dunning, State Commissioner, and B. J. Stevens, Mayor of Madison.)

MADISON, WIS., *August 4, 1884.*

**THE DEAD PERCH IN WISCONSIN.**—A singular disease is affecting the perch in the lake here, which I am unable as yet to account for. They are dying in great numbers. About 200,000 have died in the past two weeks. They show no trace of fungus or other disease. The only thing which is unusual about them is the gills, which, with the liver, are gorged with blood. Whether that is abnormal for a fish which dies of disease, I do not know. There is no fungus, the dying fish having a perfectly clear skin; they are fat or lean, male or female, full or fasting.

Perch are about the only fish that are dying; at least 95 per cent. of them are perch. There are a few white bass, still fewer suckers, and an occasional pike and sunfish. (E. A. Brigs, Professor of Zoology, University of Wisconsin, Madison, Wis., July 28, 1884.)

Mr. DUNN'S THEORY.—Having for years past followed the business of a fisherman for a livelihood, I am frequently asked, What kills the perch in Fourth Lake? My suspicion was not aroused to a great extent until I saw, day by day, an unaccountable increase in the death-rate. A living parasite or worm exists in the lake that causes the trouble. The color of this parasite on first being taken out of the water is of a light gray, with green stripes crosswise of the body, about one-half an inch in length. It is generally found where the weeds and grass are the thickest, adhering to the stems of the grass and weeds where it is easily seen by the perch who frequent these places in quest of food. The perch immediately detach the parasites from their hold, and they are at once forced towards the stomach for digestion, but on reaching the walls of the throat they fasten themselves as they do to the grass in the lake. All efforts on the part of the fish to remove them are useless, as their adhering powers are similar to those of a blood sucker. The parties heretofore examining the fish have not been able to detect this parasite, consequently their verdict was that nothing could be found as to the cause of the deaths. The fish, on coming to the surface are almost dead, with hardly life enough left to move about. On examining these you will almost in every case find nothing. Now and then you will find some specimens containing this parasite fastened to the wall of the throat in the region of the gills. Then we must look there for the cause of trouble. The parasite attacks the throat and causes inflammation by irritating that part of the body. The fish is finally overcome and strangulation takes place. In order to test what I say, catch some perch in the neighborhood where there seems to be the most in a dying condition. Let your line down to the bottom and you will have no trouble in catching the fish. You will, in every case, find three to ten of these parasites working in the throat of each fish. While the fish are dying they release themselves and return to their natural abiding place on the grass and weeds. The writer verily believes that no other fish existing in the lake will feed upon these parasites except the perch. If any other did partake of them, the same result would follow.

In regard to the whitefish dying: It is nothing unusual, as more or less die, according to the temperature of the water, every year. The hotter the summer season, the more dead whitefish will be seen floating on the surface. They live in the coolest water in the lake, which is the deepest. The presence of any large fish drives them out of their favorite place, and being naturally very tender, when they pass into water of a great deal higher temperature, death ensues. Try this experiment: Take minnows out of the lake in the summer season and place them in well-water; death follows. Now, take minnows in winter-time out of the lake

and put well-water upon them, and death also follows. There is too sudden a change of temperature. Apply this experiment in the white-fish case, and you have the reason of their death. (From Wisconsin State Journal, August 5, 1884.)

**THE BIRDS DYING ALSO.**—About ten days ago the swallows and sparrows began to die at the State Insane Hospital, and day by day many of the innocent creatures have fluttered helplessly to the ground and soon become dead. Great numbers of the birds abound around the hospital, and the sudden and numerous deaths, not only in the immediate neighborhood of the hospital, but throughout the entire farm, have occasioned genuine surprise. The birds will suddenly drop to the ground while flying through the air overhead, in places entirely remote from telegraph wires, trees, or other obstructions against which it is possible to injure themselves, and die without a flutter or any indication of pain. The doctors and attendants at the hospital have repeatedly thrown the birds into the air again, in the hope that they would be able to resume their flight, but in every instance they have fallen back to the earth again, to die. Governor Rusk has observed a few of the dead birds around his home, and others residing on the shores of Lake Mendota have noticed the same phenomenon.

Superintendent Buckmaster, of the State Insane Hospital, has a theory in regard to the cause of their deaths. He says that myriads of flies swarm upon the putrefying bodies of the dead perch upon the shores of Lake Mendota, where they feast, and that these flies are eaten in great quantities by the birds, which would indicate that the death of the latter is attributable to the same cause as that of the former. If the birds really do die from eating the flies, then the superintendent states that he believes the fish, upon which the flies feed, are troubled with blood-poisoning. The mystery of the fish mortality certainly deepens, and is greatly intensified by the fatality which has so recently stricken the birds.

In this connection it may be well to say that a little boy residing in this city drove off the railway bridge into Lake Menona, a few days ago, and was stung so severely in one of his eyes by some animal beneath the surface of the water that he has been unable to use it in any way since. When he sustained the injury he saw no object, and feels confident that it must have been done by some insect or worm very small in size. (From Wisconsin State Journal, August 6, 1884.)

**TWO HUNDRED TONS HAULED AWAY.**—The mortality of perch and other fish in Lake Mendota, Wisconsin, continues, and scientific men from various parts of the country have been called to investigate the matter. Thus far 200 tons of dead fish have been hauled away from the shores of the lake by the city authorities. The worst mortality prevails when the lake is very still or gently stirred by a south wind. On a rough estimate 3,000,000 fish have died in the lake, and their bodies have drifted to the shore. Perch are the only fish dying whose death cannot

be accounted for. Whitefish are going to a certain extent, but they die every year on account of being driven from the cold water near the mouth of the springs which supply the lake, where they congregate, into the warm water which prevails everywhere else. A few pickerel also are seen dead, but not enough to cause the idea of an epidemic. It is the perch which get the best of fishermen now by their death. The dead perch range in size from one-half pound to 2 pounds. They have strewn the shore for nearly four weeks. Cart-loads are taken away and buried, but still the shore is covered with their carcasses. Every gale, every breeze that blows, strews them over the waves. Theories are numerous regarding this disease. One attributes it to an insect that gets into their windpipe and chokes; another notices a black spot near the gill and attributes to its presence the cause of which death is the effect. (Madison Transcript, August 7, 1884.)

### 213.—DESTRUCTION OF FISH-FOOD BY BLADDERWORT (*Utricularia*).

By S. A. FORBES.

[From Forest and Stream, September 4, 1884.]

While the very interesting fact of the destruction of young fishes by the bladderwort is occupying the attention of your readers, permit me to mention another method than that of direct destruction by which these plants must often greatly hinder the multiplication of fishes in waters infested by them. In an article on the entomostraca of Lake Michigan and adjacent waters, which I published in the American Naturalist for July, 1882, I remarked that in ten "bladders" of *Utricularia vulgaris*, taken at random; I found ninety-three animals, either entire or in recognizable fragments, and representing at least twenty-eight species. Seventy-six of the animals found were entomostraca, and belonged to twenty species. Nearly three-fourths of both individuals and species were cladocera. Just one-third of all the animals found in the bladders belonged to the single species *Acroporus leucocephalus* Koch. Now, my studies previously made of the food of young fishes, reported chiefly in the third bulletin of the Illinois State Laboratory of Natural History, showed that the principal food of all young fishes, with quite insignificant exceptions, consists of the very class of minute animal forms which the bladderwort is constantly engaged in selecting from the water by means of the hundred of bladders with which each plant is covered. It thus not only occasionally entraps the youngest fishes, but likewise habitually and continuously contends with them for food, and may be said to thrive largely at their expense.

NORMAL, ILL., August 29, 1884.