

**CHANGES IN THE FISHERIES OF THE GREAT LAKES DURING THE
DECADE, 1870-1880.**

By CHAS. W. SMILEY.

A somewhat wide-spread impression exists in the lake region that the fisheries of the Great Lakes are decreasing. That the number of pounds of fish annually caught is less than formerly is not true, and yet this instinctive impression is doubtless correct if formulated differently. That the resources are diminishing and liable to fail us is true.

From the statements of Mr. J. W. Milner, who visited the fisheries in 1871, and whose report was published by the United States Fish Commission, and by comparison with the investigation made in 1879 by Mr. Ludwig Kumlein under the auspices of the Fish Commission and Tenth Census, the following facts appear:

I. The total number of pounds of fish obtained from the Great Lakes in 1879 was equal to or greater than the yield of any years in the first part of the decade.

II. The apparatus for capture has increased in effectiveness enormously, probably 500 per cent. The increased effectiveness was produced by the introduction of finer meshes in nets, the addition of steam-tugs, the increase of pounds, and very great increase in the number of gill-nets in use. The number of fishermen also increased.

III. The average size of the whitefish and trout taken greatly diminished during the decade.

IV. A considerable number of valuable fishing places became seriously or wholly exhausted. New places were sought out and the supply thus kept up.

V. From these few facts the following conclusion is drawn: The perfection which the apparatus has attained, the diminution in the size of the fish taken, the exhaustion of numerous localities, and the fact that fishing is pressed under these circumstances enough to keep up the maximum supply, indicate that, in the natural order of events, remarkable diminution if not complete collapse is to be anticipated in the coming decade.

VI. The natural order of events may be averted by regulation of the size of meshes, preventing the pollution of the waters, and by artificial propagation.

In support of the foregoing statements the following details are submitted:

I. *The supply maintained.*—In his report for 1872 Mr. Milner gave a table of "the number of pounds of lake fish received by first handlers," but he stated that his figures for Sandusky, Milwaukee, Green Bay, and Mackinaw were incomplete. He then adds: "The sum total of this incomplete record is 32,250,000 pounds of fish." Mr. Kumlein's figures

for 1879 foot up 68,742,000 pounds. That the total supply was not very much larger in 1879 than in 1872 is the universal opinion. It is also likely that the completion of the figures for 1872 would make a total of at least 50,000,000 pounds. In this period, the trade of Buffalo, Milwaukee, and some other places fell off, but was compensated by the increase of trade in Chicago. This decline at Buffalo from 1872 to 1879 Mr. Kumlein places at from 6,374,100 pounds to 4,001,000 pounds. It is impossible to state the exact decline at Milwaukee, but one house reports a decrease from 14,000 half-barrels to 2,058 half-barrels; another house sold 8,000 half-barrels in 1871, 7,000 in 1872, and but 1,908 in 1879. A third firm handled 6,623 half-barrels in 1872, and 10,397 in 1873, but only 2,003 half-barrels in 1879. The only other wholesale dealer gave no comparative figures.

	Pounds.
In 1872 Mr. Milner put the transactions in Chicago at	7, 461, 102
In 1875 the total is given by a Chicago firm at	11, 500, 000
In 1876 the total is given by this same firm at	12, 240, 000
In 1877 the total is given by this same firm at	14, 000, 000
In 1879 Mr. Kumlein put the Chicago trade at	17, 247, 570

II. *Maximum effectiveness of fishing.*—The summaries of apparatus used in Lake Michigan as given by Mr. Milner in 1872 and by Mr. Kumlein in 1879 compare as follows:

	For 1871.	For 1879.
Pound-nets	281	476
Gill-nets	450	24, 599
Sail-vessels and boats	689	612
Steam-tugs	4	30

In their report the Wisconsin commissioners say: "The number and variety of nets used for fishing are appalling, and their destruction character, supplemented by the spear, is rapidly exterminating the whitefish and salmon, trout in Lake Michigan, Green Bay, and in many of the larger inland lakes."

In 1860 Mr. Kalmbach, who at present is a dealer in Green Bay, began fishing with the pound-net in Bay de Noquet; pound-nets were at that time a new institution in these waters, and in fact his was one of the first trials. He employed two pound-nets, one 18, the other 20 feet deep and 25 by 30 feet square. From the 10th of October to the 25th of November he took from these nets and salted 1,750 half-barrels, or 175,000 pounds, of No. 1 white fish, and could he have secured assistance, salt, packages, &c., he could have more than doubled this amount. Very few fish were smaller than No. 1. Of late years the pound-nets have contained smaller and smaller meshes.

The Wisconsin commissioners, in their report for 1874, state: "At Racine there are four boats in constant use putting out and taking up not less than twenty-five miles of gill-nets. We are told by Mr. Jacob Schenkbarger, one of our oldest and most intelligent fishermen, that with an

equal number of nets only one-fourth as many fish are caught now as were taken four years ago. He further says: 'Late in October in 1870 I took with a set of thirty nets, at one time, 1,980 pounds of dressed trout. Four years ago it was common to take from 1,000 to 1,500 pounds of fish at each trip. Now we never go over 500, and not unfrequently go less than 200 pounds. The lake is filled with nets and the fish can hardly escape.'

In the report of 1875 the Wisconsin commissioners say: "At Milwaukee there are four steam smacks and two sailing smacks engaged in fishing. These six smacks have a total of sixty-five miles of nets. Each steam-smack costs about \$7,000. The capital invested at that place is not far from \$75,000. Kenosha employs four smacks, with about thirty miles of nets, and the catch is about equal to Racine. In these places, Kenosha, Racine, and Milwaukee, there is a total of one hundred and twenty-five miles of gill-nets used. There is a total of nets used in the waters of Lake Michigan to extend from one end of the lake to the other. During the year 1875 there has been great complaint of scarcity of fish, and there has been a falling off of at least one-fourth; so that it is evident to all that the waters of Lake Michigan are being gradually depleted of fish."

III. *Size of fish diminished.*—In their report for 1875 the Wisconsin commissioners say: "In former days the fishermen used nets of a larger mesh and took whitefish that weighed from 8 to 14 pounds each, the latter figures being the largest known to have been caught. Now they have to use smaller-meshed nets and take smaller fish, the larger ones being almost unknown now."

From Green Bay, Mr. Kumlein reported, "Of late years pound nets with small meshes have been largely employed, and thereby millions of young whitefish have been destroyed."

Writing from Port Clinton, Mr. Kumlein says: "In Mr. Nickels' opinion the mesh is now rarely one-half the size it was ten years ago. The fishermen and dealers generally pronounce the decrease, especially of whitefish, very great indeed. However, Mr. Mathews, of Port Clinton, thinks there are just as many whitefish as ever, and as many caught; but, being distributed among more fishermen, they individually take less than formerly. Collectively, the catch is pretty much the same as it was ten years ago, or ever was, in his opinion."

From Menominee, Wis., Mr. Kumlein writes: "The number of whitefish to a half-barrel is yearly growing greater. Sixty has been thought a good number; now ninety is common. I am informed by Capt. Thos. Larsen, of Menominee, that he has seen a half-barrel filled with twelve no longer ago than 1874. It is the opinion of fishermen north of Menominee that the whitefish increased in numbers on their shore till 1876, when the yield rapidly fell off till the present date; it is estimated to have fallen off two-thirds since 1875."

At Washington Island, in 1878, there were over 5,000 barrels, equal to fully 7,500,000, young whitefish thrown away, being too small for market.

Writing from Green Bay, Wis., Mr. L. Kumlein says: "During the autumn of 1878 and the spring of 1879 a prominent dealer at this point collected from fishermen along the shore of the bay large quantities of whitefish, which he purchased already packed and salted in half-barrels; they were bought for No. 1 fish, but in repacking he found some of the packages to contain as many as 600 fish, and of course none were large enough for No. 1. There were a very few No. 2, and the lot was even barely salable as No. 3. Many were found that did not measure 3 inches dressed."

IV. *Depletion and search for new fisheries.*—Of the eastern shore of Green Bay, Mr. Kumlein says: "The once famous fisheries of 'the door' around Washington and Saint Martin's Islands, Little Sturgeon Bay, and Chambers Island are no more. On the grounds where once forty staunch mackinaws and five steam tugs with about 4,000 gill-nets brought to their owners in the neighborhood of \$100,000 a year, the fishing is now carried on by a few superannuated Indians and the gulls. The same grounds that in 1873 yielded \$4,000 in four months from two pound nets (Chambers Island), this year have yielded not quite \$400 worth, and that with nets twice as large. The fishing grounds about 'the door' were to the north and west of Washington Island and south and west of Saint Martin's, extending out in either direction for eight miles and between the two islands the whole distance. These grounds were probably the greatest whitefish spawning grounds in existence prior to 1868. Now they are nearly abandoned, both by fish and fishermen. From May 1 to August 15, 1873, Mr. Blakefield, now of the firm of Blakefield & Minor, of Fish Creek, sold of fresh fish, from two small pound nets set off Chambers Island, \$4,175.91 worth. This year on the same grounds, with nets double the size, and in twice the length of time, the product has been a trifle less than \$400. On the same grounds, where one boat with two men sold from their gill-nets \$9,000 worth of fish in one year, there is no fishing at all now."

Mr. Windross, of Green Bay, estimates that at Oak Orchard and Pesaukee the catch of whitefish has fallen of 90 per cent. since 1869. He lays the decrease, in a great measure, to the sawdust polluting the spawning beds, and in corroboration of his statement cites the following, which he himself has witnessed: In 1845, the whitefish came up the Oconto River as far as the falls, 20 miles, to spawn. With a small seine he took 1,200 half-barrels and could have taken a great many more if he could have used them. This was only at one locality, and they entered all the weirs in the same manner. Now the river bottoms are one mass of sawdust, and it also extends far out into the bay so that the sheltered shoals are so covered that the fish desert them. Sawdust bottom extends out two miles from shore about the mouth of the rivers. Mr. Windross thinks the whitefish spawn more around the island and on the east shore; very few spawning on the shore from Suamico to Peshtigo Point.

Of the tributaries of Green Bay near Menominee Mr. Kumlein writes: "From fifteen to thirty years ago the most profitable fishing grounds were in the Menominee River near its mouth. Here racks were constructed which caught the fish as they came down from spawning. On such racks as high as 600 barrels of whitefish have been taken in one autumn on a single rack."

Mr. Eveland says that not a whitefish has been caught in the river for the past twelve years. As soon as the sawdust began polluting the river the whitefish abandoned it. It was no unusual occurrence to take 600 barrels of whitefish in a season twenty years ago, on one of the Menominee River racks.

"Duluth, Minn., does not seem to have been much of a fishing point until recently. Now the industry is assuming much greater proportions than in 1879. The town itself is only a few years old."—(Statement of Ludwig Kumlein, June, 1880.)

Of Bayfield, Wis., Mr. Kumlein says: "The total number of men employed in 1879 was 130. In 1880 there were over 200. Pounds have been fished here for about twelve years. We could not learn that the decrease had been at all alarming. Ashland Bay (Chequamegan Bay) seems to have suffered the most, it is thought because pound nets have been set there the longest. When a certain locality begins to show signs of giving out, a new one is found, and a rest of a few years is said in some cases to have restored the depleted waters. The present year (1880) the fishing is said to be better than ever before, but it must be remembered that the facilities for capture are better, the men more experienced, and the grounds better known. There is also more twine in use than ever before."

August 30, 1880, Messrs. W. W. Paddock & Co., of Ashland, Wis., who own over 1,200 gill-nets, 23 pound-nets, and 7 seines, write: "There seems to be only one-third of the whitefish caught near Ashland that there formerly was."

Of the fisheries of Lake Superior from Keweenaw Point to Huron Bay, where the catch in 1879 was 8,000 barrels, mostly whitefish and trout, Mr. Kumlein writes: "Whitefish are said to have decreased considerably in fifteen years, especially in Keweenaw Bay."

Mr. Kumlein, writing from Marquette of the fisheries extending 30 miles east and west of that place, says: "Fifteen to twenty years ago the fishing was done almost entirely with hooks for trout and only with gill-nets for whitefish. Pounds were not used till 1869. There is supposed to have been a gradual decrease, especially among the whitefish and trout. This is stoutly denied by some, who say the fish have merely moved to grounds inaccessible to the fishermen, or not yet discovered by them."

Mr. Kumlein says of Whitefish Point: "This fishery was purchased in 1870 by Jones & Trevalle, of Buffalo, New York, who employ a steam-tug, 2 Mackinaw boats, 2 pound-nets, 2 seines, and 36 box gill-nets. Of late the fishing has not been so profitable as it was five or six years

ago. In 1879 there were but 350 half-barrels salted, while in 1874 there were 2,300. They take only whitefish and trout. In the last three years the catch has been too poor to pay expenses."

West coast of Lake Michigan.—Mr. Kirtland, of Jacksonport, Door County, says that in his neighborhood the amount of whitefish has fallen off fully one-third in seven years. No fresh fish at all is sold here now, as it was three years ago, but it is all salted and disposed of to coasters.

Mr. Marion, of Oostburgh, says that as many fish were caught the last three years as usual, but the number of nets have greatly increased, so that the decrease of each man's catch is thought by some to be fully one-half in 10 years.

At Pentwater, once such a famous ground, there are at present but two boats. In 1874 there were five; 10 years ago, seven; and good fishing; now it is an almost abandoned locality.

Concerning the Mackinaw fisheries, the figures are quite reliable. In 1874, Judge G. C. Ketchum ascertained the product of that year to be equal to 3,542,840 pounds fresh, and in 1879 Mr. Kumlein shows the product to be equal to 3,259,896 pounds fresh, or a decrease of 282,944 pounds, or 8 per cent., in five years.

The other lakes.—While visiting Lake Huron, Mr. Kumlein wrote: "It is estimated by Mr. Case that 10 years ago with the same number of nets now used, three times the amount of fish would have been caught. He used to put up 1,200 barrels in a year. Now he seldom gets over 30 tons."

Writing from Erie, Pa., Mr. Kumlein says: "Many years ago Barcelona was the most important fishing point on Lake Erie, but at the present time it amounts to but little. Dunkirk was also for a long time famous, but very little is done there now. Erie, on the other hand, is improving."

In 1872 Mr. Milner wrote of Sodus Point: "There are three boats here fishing pound nets." In 1879, Mr. Kumlein says, "Now there are none."

In 1872 Mr. Milner said: "Poultneyville, N. Y., has been a resort for Canadian fishermen for years. Fourteen or fifteen years ago they came over in numbers, and they came almost every year." In 1879 Mr. Kumlein said, "Now there are none at all."

From Sacket's Harbor, Mr. Kumlein writes: "Clark & Robbins, of Sacket's Harbor, say, that in 1879 they salted 2,447 half-barrels ciscoes, while in 1879 they got only 100. They think such fish as pike, black bass, trout, &c., have increased since the alewives came, and that the whitefish and ciscoes have greatly decreased."

From Lorain County, Ohio, Mr. Kumlein writes: "The general impression seems to be that the decrease among the whitefish for ten years has been very great. Ten years ago there were not more than half as many nets as now, yet a much greater quantity of fish was taken."

Speaking of the vicinity of Green Bay Mr. Kumlein says: "Five years ago Chambers Island supported nine pound nets, doing a good business. Now there are but two, and those did not pay expenses the last year. In 1873, Mr. Minor alone sold to two firms, one in Chicago and one in Buffalo, \$19,571.95 worth of salt fish, and \$700 worth of fresh fish. At the same time a Cleveland firm on Washington Island did more than double this business. At the present time none at all are shipped from these same grounds which once yielded such a revenue. Prior to 1873, the average shipments per week from May to July was 700 half-barrels, worth on an average \$4. About 1874 the greatest decline was appreciable, and then the fishing suddenly dropped off entirely."

"From 1870 to 1873 between 60 and 100 tons were shipped from Fish Creek, and all taken within a radius of ten miles. These were worth four cents a pound to the fishermen on the ice."

V. *The crisis.*—If the facts heretofore presented establish the allegation that (1) the number of pounds of fish caught has been maintained, but (2) by enormously increased and effective facilities, (3) that large fish are seldom caught and that the small ones have not been allowed to survive, so that (4) already many fishing places have entirely failed up, it cannot be denied that a crisis has been reached such as seriously to alarm all who are interested in these lake fisheries.

VI. *The remedy.*—The great efficiency of apparatus which has been reached will remain. We do not retrograde. Men will still use the powerful appliances which they have discovered. But it is possible for the neighboring States to regulate by law the size of the mesh and some other minor details. This some of the States have attempted, and no doubt others will imitate them. It is also greatly in the interest of certain localities to prevent the pollution of their waters with sawdust, decayed lumber, offal, &c.

Artificial propagation has already been attempted on a limited scale and the methods pretty well worked out. It is believed that if carried on extensively it may become a very powerful factor in the remedy desired.

EXTRAORDINARY FLOODS IN THE POTOMAC RIVER.

By GEO. R. MARQUETTE.

[Extract from letter to Prof. S. F. Baird.]

To the best of my knowledge the heights of rivers at this point in the flood of 1870 were 28 feet 6 inches above low-water mark; this was on the 30th day of September. In the flood of 1877 the greatest height was 29 feet 9 inches above low-water mark; this was on the 25th day of November. This flood was the highest ever known in this town.

HARPER'S FERRY, W. VA.,

January, 17, 1882.