# NOTES ON THE FISHES AND MOLLUSKS OF LAKE CHAUTAUQUA, NEW YORK.

By BARTON WARREN EVERMANN and EDMUND LEE GOLDSBOROUGH.

In the last week in September, 1901, the senior writer of this paper spent four days at Chautauqua Lake, during which time he obtained specimens of most of the species of fishes and mollusks which inhabit it, together with a number of notes and descriptions on some of the more important species. Collecting was done in Clear Creek and Black Creek, small streams which enter the lake on the west side at Lighthouse Point, in the lake about their mouths, and at the various places along the north and northeast shores of the lake. Mollusks were also collected at different points about the north end of the lake.

Lake Chautauqua lies in the central part of Chautauqua County, which is situated in the extreme western part of the State of New York. The lake is a long and narrow body of water, with its main axis lying in a northwest and southeasterly direction. The length of the lake is about 22 miles, and the width varies from 3 miles to scarcely more than a quarter of a mile in its narrowest place. The greatest depth of the lake is said to be 80 feet, at a point between Chautauqua and Long Point. The water is said to be 62 feet deep quite close in to Long Point; but the greater portion of the lake is relatively shallow, and the depth probably does not average greater than 20 feet. The entire northern end seems quite shallow, probably not exceeding 15 or 20 feet at any place.

The lake is surrounded by gently sloping hills, the highest rising 200 or 300 feet above the water surface. These hills are, as a rule, all cultivated to the summits, and doubtless much sediment is carried into the lake from surface erosion on the surrounding cultivated ground. The shores of the lake are usually moderately abrupt, though nearly everywhere there is a strip of beach, more or less narrow and frequently wet or marshy. At the north end is a considerable tract of low ground, moderately timbered and inclined to be marshy. Around the shores and in shallow water are good growths of *Scirpus*, and water lilies were noticed in a few places. In the water were noted also such aquatics as *Myriophyllum*, *Ceratophyllum*, *Potamogeton*, and the like.

The elevation of the lake above sea level is given as 1,291 feet, and

726 feet above Lake Erie, from which it is distant only about 8 miles. Though so close to Lake Erie, Chautauqua Lake lies in the Ohio River hydrographic basin. Its outlet issues from the southern end as Conewango Creek, which, after being joined by Cassadaga Creek, enters the Allegheny River at Warren, Pa. The lake has no important inlets.

Situated as Lake Chautauqua is, in the Ohio basin, its fish fauna is essentially like that of other portions of that hydrographic basin. It more closely resembles that of the Lower Wabash than that of Lake Erie, though lying so close to the latter.

The most interesting feature of the fish fauna of Lake Chautauqua is the Chautauqua muskallunge, which is peculiar to this lake and the Ohio River. It is a food and game fish of great importance, and is propagated extensively by the State.

The special provisions of the law pertaining to fishing in Chautauqua Lake, as published in 1901 by the Forest, Fish, and Game Commission, are as follows:

SECTION 82 (*Fishing in Chautauqua Lake*).—Fish of any kind shall not be taken in Chautauqua Lake from May 1 to June 15, both inclusive, unless by the State for purposes of propagation. Black bass, yellow bass, rock bass, and muskallonge shall not be taken from December 1 to June 15, both inclusive, except as provided for in section 83.

SECTION 83 (*Chautauqua Lake exception*).—Muskallonge and bill-fish may be taken with spears, using fish houses and decoys, on Mondays and Thursdays of each week for five consecutive weeks, beginning on the first Monday in February. No such fish house, decoy, or spear shall be upon the ice or waters of Chautauqua Lake between the hours of 6 o'clock at night and 6 o'clock in the morning, or on any day except Monday or Thursday, as above provided. Bullheads may be fished for and taken through the ice with hooks and lines or tip-ups in Chautauqua Lake. All fish houses or other contrivances for hiding fishermen shall at all times be open to the inspection of peace officers or protectors, and unless in actual transit from the shore to or from a fishing place are hereby declared to be a public nuisance upon the ice or waters of Chautauqua Lake at all times not therein allowed. Such nuisance may be summarily abated by any officer or private person by the destruction thereof.

Briefly stated, the close season for black bass, yellow bass (*M. Dolomieu*), rock bass, and muskallunge extends from December 1 to June 15, both inclusive; the close season for all species from May 1 to June 15, both inclusive; black bass, yellow bass, rock bass, and muskallunge may be taken by angling from June 16 to November 30, both inclusive; muskallunge and bill-fish may be taken with spears on Mondays and Thursdays for five consecutive weeks, beginning with the first Monday in February; bullheads may be taken through the ice with hooks and line or tip-ups at any time. These provisions are well drawn and are apparently adequate for the protection of the food and game fishes of this lake.

The following lists are based chiefly upon the collections made during the visit to the lake already mentioned. Certain additional data obtained at other times have been included.

## FISHES OF LAKE CHAUTAUQUA.

The classification and sequence of species in the following list follow that adopted by Jordan and Evermann in the Fishes of North and Middle America.

1. **Polyodon spathula** (Walbaum). *Paddle-fish; Spoon-bill Cat.*

The only record of the capture of this curious fish in this lake is that of a photograph by R. W. Banjean, of Mayville (situated at the head of the lake), of an example caught about 1890. The fish is said to have been 6 feet 2 inches in length, 4 feet around the body, and to have weighed 123½ pounds. This is one of the largest individuals of this species that has been recorded. The very largest of which we have a trustworthy record was taken in Lake Manitou, Indiana, and weighed 163 pounds.

2. **Lepisosteus osseus** (Linnæus). *Bill-fish; Long-nosed Gar; Gar Pike.*

3. **Lepisosteus platostomus** Rafinesque. *Bill-fish; Short-nosed Gar.*

These two species of wholly useless fishes are too abundant in this lake. In 1896 and 1897, at the request of the Farmers' and Citizens' Game and Fish Protective Association of Chautauqua County, two special appropriations of $1,000 and $500, respectively, were made by the legislature for the destruction of the gar pike or bill-fish, which, it was believed, were destroying the young bass and muskallunge in Lake Chautauqua. In 1896 netting for these fish was begun, and was continued in May and on into July, 1897. Seines, pound nets, and traps were used. The pound nets did the best work, and in 1887 these only were used. In 1896 there were caught and killed 2,606 bill-fish. The next year 1,316 were killed. In this latter year more nets were used and greater efforts put forth, but the smaller number of fish caught was doubtless due to the effect of the previous year's work, and it is now believed that with little more effort these fish can be practically exterminated.

Replying to a letter of inquiry, Mr. Charles H. Babcock, of the New York Forest, Fish, and Game Commission, says that "nothing has been done toward the extermination of the gar pike at Chautauqua Lake since 1897, with the exception of what has been done when we were taking muskallunge for propagating purposes in the spring of the year. A few have been taken each year since 1897 in that way, and they have always been destroyed. No appropriation has been made for the purpose since 1897, as the work was apparently very thoroughly done at that time. Very few, if any, gar pike have been seen or taken since then, from any information I can get. They are apparently a very much easier fish to get rid of than the carp."

4. **Amia calva** Linnæus. *Bowfin; Dog-fish.*

A local fisherman described a fish which he had seen in the lake, which was evidently this species. He called it "eel-pout." No examples were seen by us.

5. **Ameiurus nebulosus** (Le Sueur). *Small Cat-fish.*

Very abundant, reaching a weight of 1 to 3 pounds. Great numbers are caught; an important and excellent article of food.

6. **Ameiurus melas** (Rafinesque). *Common Bullhead.*

This is perhaps equally common with the former, but owing to its smaller size is of much less importance.

7. **Schilbeodes miurus** (Jordan). *Mad Tom; Stone Cat.*

This little fish is probably not common in the lake; only one specimen was obtained.

8. **Catostomus commersonii** (Lacépède). *Common Sucker.*

9. **Catostomus nigricans** (Le Sueur). *Hog Sucker.*

Both of these suckers are probably common.

**10. Moxostoma aureolum** (Le Sueur). *Common Redhorse.*
Probably common.

[**Cyprinus carpio** Linnæus. *German Carp.* This fish has been introduced into this lake and is said to be common.]

**11. Campostoma anomalum** (Rafinesque). *Stone-roller; "Chub."*
Abundant here, as it is everywhere in the Ohio Valley.

**12. Pimephales notatus** (Rafinesque). *Blunt-nosed Minnow; "Chub"; "White-nosed Chub."*
This minnow is abundant in the lake, and is one of the very best bait fishes. It is regarded as the best bait for the small-mouth black bass.

**13. Semotilus atromaculatus** (Mitchill). *Creek Chub; "Chub."*
The creek chub is common, particularly in the small streams tributary to the lake. It is an excellent bait minnow for the muskallunge.

**14. Notropis cayuga** Meek. *Cayuga Minnow.*
This interesting little minnow is not uncommon. It is usually too small for bait except for yellow perch.

**15. Notropis hudsonius** (De Witt Clinton). *Shiner; "Cisco."*
This important minnow, absurdly called "cisco" at Mayville, is common in Chautauqua Lake. It reaches a length of 3 to 6 inches, and is one of the very best bait minnows found in the State. It is a favorite minnow when trolling for the muskallunge, whose food is said to consist largely of this species.

**16. Notropis whipplii** (Girard). *Silver-fin; "Shiner."*
This minnow was found fairly common in Clear Creek near its mouth. It is one of the best bait minnows.

**17. Notropis cornutus** (Mitchill). *Redfin; "Shiner."*
Quite common in Clear Creek; an important bait minnow.

**18. Rhinichthys atronasus** (Mitchill). *Black-nosed Dace; "Creek Chub."*
Not uncommon in Clear Creek, most of the examples obtained being small.

**19. Salvelinus fontinalis** (Mitchill). *Brook Trout.*
The brook trout is said to occur in one or more of the small creeks on the east side of the lake.

**20. Lucius ohiensis** (Kirtland). *Chautauqua Muskallunge.*
The muskallunge is by all odds the most important fish found in Chautauqua Lake, whether considered from the standpoint of the angler or that of the commercial fisherman. It is very different in appearance from the muskallunge of the Great Lakes and apparently deserves to rank as a distinct species. The following color description was drawn up from a fresh example, 25 inches long, weighing 4 pounds, caught in the north end of the lake, near Mayville, September 26:

Back nearly uniform dark olive-green; upper two-thirds of side rich brassy green, with some metallic green; about 25 faint narrow darker vertical bars extending somewhat below the lateral line; lower third of side paler and more brassy, the 25 vertical bars widening into broad darkish blotches, these most greenish on posterior third of body; top of head very dark green; scaled part of head brassy greenish; lower part of side of head with less brassy and less greenish, and some silvery, especially on lower part of opercle; rim of lower jaw and throat white; breast with a few round greenish spots; rest of belly white; fins dark olive, with numerous darker greenish spots; iris grayish brown. The crossbars are rather broad and do not break up distinctly into diffuse spots, and the fin spots are greenish rather than black. The general color is a rich greenish brassy, with very indistinct darker green crossbars.

This species was described in 1854 by Dr. Kirtland from a specimen from the Mahoning River, Ohio. The real home of the fish, however, is Chautauqua Lake, only occasional individuals being taken elsewhere in the Ohio basin. As early as

1818 Rafinesque obtained it in the Ohio River. He says, "It is one of the best fishes in the Ohio; its flesh is very delicate and divides easily, as in salmon, into large plates as white as snow. It is called salmon pike, white pike, white jack, or white pickerel, and *picaneau blanc* by the Missourians. It reaches a length of 5 feet." It would appear from this that the muskallunge was a common, well-known fish in the Ohio a hundred years ago, even if we make some allowance for a possible misapplication by Rafinesque of some of the vernacular names.

Although abundant in Lake Chautauqua, it is of rare occurrence elsewhere in the Ohio basin, and it is not found naturally in any other. It is said to occur in Lake Conneaut, Pennsylvania; Kirtland got it in the Mahoning, and we have seen the head of a large example taken in the Ohio near Evansville.

For more than ten years the New York State Fish Commission has been propagating the Chautauqua muskallunge with signal success. The first attempt, which was in the nature of an experiment, was made in the spring of 1890, under the immediate direction of Mr. Munroe A. Green. Although the work was not begun until rather late in the spring, it resulted in the development of successful methods and the hatching of 75,000 fry, which were planted in the lake. This is believed to be the first successful attempt to hatch the muskallunge by artificial methods, and the work has been continued with increasing success every year since that date, as shown by the following tabular statement:

| Year. | Number of fry hatched. | Number planted in Chautauqua Lake. | Number planted elsewhere |
|---|---|---|---|
| 1890 | 75,000 | 75,000 | ..... |
| 1891 | 1,750,000 | 1,750,000 | ..... |
| 1892 | 1,360,000 | 1,260,000 | 100,000 |
| 1893 | 2,150,000 | 1,150,000 | 1,000,000 |
| 1894 | 2,970,000 | 1,970,000 | 1,000,000 |
| 1895 | 2,480,000 | 1,700,000 | 780,000 |
| 1896 | 1,815,000 | 1,000,000 | 815,000 |
| 1897 | 3,075,000 | 1,815,000 | 1,260,000 |
| 1898 | 2,650,000 | 900,000 | 1,750,000 |
| Total | 18,325,000 | 11,620,000 | 6,705,000 |

New York was the first State to undertake the hatching of the muskallunge artificially and is the only one that now does it except Wisconsin, and it has only been by this artificial propagation that the supply of these fish has been kept up. In about two years after this hatching was begun at Chautauqua there was a perceptible increase in the number of muskallunge taken by the fishermen. Since then the supply has kept about normal, and it is not now known that the number has increased or decreased in the past few years, but it is known that there is no better place in the world to fish for muskallunge than at Lake Chautauqua.

As a game fish the Chautauqua Lake muskallunge is by many held in very high esteem. Though it may not be a great game fish in the best sense, its size, which is often enormous, renders its capture and landing by means of hook and line an undertaking by no means devoid of exertion and interest. It is usually taken by trolling either with a spoon or good-sized minnow. At the time of our visit to this lake, the last week in September, the spoon seemed to be chiefly in use by the local anglers. A comparatively short line was used, and the boat was rowed only fast enough to keep the tackle in shape, the spoon being kept only a short distance under water. Later in the season, it was stated, minnows would be used. The "chub" (*Semotilus atromaculatus*) is the minnow most used early in the fall, but later, when the water becomes colder, the "shiner" (*Notropis cornutus*) is regarded as the better bait. The "cisco" (*Notropis hudsonius*) is also an excellent muskallunge bait and is said to constitute a considerable part of the regular food of that fish. The 4-pound example upon which the above color description was based had been feeding upon yellow perch, and one small example of that species was

found in its mouth. As a matter of fact, the muskallunge will doubtless feed upon almost any species of fish found in the lake.

As a food-fish the muskallunge is a superior fish. Dr. Kirtland says that "epicures consider it one of the best fishes of the West," and Mr. J. L. Beaman affirms that "as a food-fish there is nothing superior to it. It ranks with the salmon and speckled trout and surpasses the black and striped bass. The meat is almost as white as snow, fine-grained, nicely laminated, and the flavor is perfect." The quality of the meat seems to improve upon keeping. We ate choice pieces, that were fried, of an 8-pound muskallunge the day it was caught and found the meat white and flaky, but dry and with little or no flavor. Three days later we ate again of the same fish and found the meat decidedly more juicy and with a very pleasant flavor.

The muskallunge is as voracious as the pike, and 80 pounds of muskallunge represents several tons of minnows, white-fish, and the like. It is not a common fish; its great size and voracity perhaps account for this. As Charles Hallock has said, the muskallunge "is a long, slim, strong, and swift fish, in every way formed for the life it leads, that of a fierce and dauntless marauder."

**21. Labidesthes sicculus** (Cope). *Brook Silverside; Skipjack.*

Only two or three specimens of this interesting species were obtained, but it is doubtless abundant in the lake. At Lake Chautauqua we were assured that these fish were young muskallunge!

**22. Ambloplites rupestris** (Rafinesque). *"Rock Bass"; Red-eye; Goggle-eye.*

The rock bass is an abundant and well-known fish at this lake. On September 26 a number were taken with line and hook baited with grasshoppers, off the piers at Mayville. All seen were small.

**23. Lepomis pallidus** (Mitchill). *Bluegill; Blue Bream; Blue Sun-fish; Copper-nosed Bream; "Sun-fish."*

The bluegill is another abundant and well-known fish in this lake. It reaches a weight of one-half pound and is one of the best pan fishes.

**24. Eupomotis gibbosus** (Linnæus). *Common Sun-fish; "Pumpkin-seed."*

Apparently common, but less so than the bluegill.

**25. Micropterus dolomieu** Lacépède. *Small-mouthed Black Bass; "Yellow Bass."*

The small-mouthed black bass is doubtless the gamest fish in the lake. It does not appear to be very abundant. It is locally called "yellow bass," and is mentioned in the State law by the same absurd name. The name "yellow bass" is properly applied only to *Morone interrupta*, a very different fish, which is found in the Mississippi Valley and not in Chautauqua Lake.

**26. Micropterus salmoides** (Lacépède). *Large-mouthed Black Bass; Straw Bass; "Striped Bass."*

The large-mouthed black bass, known locally as "striped bass," is common in the lake and is an important game fish.

**27. Perca flavescens** (Mitchill). *Yellow Perch; "Perch."*

Apparently not common and not reaching the size it does in some other lakes.

**28. Percina caprodes** (Rafinesque). *"Sand Pike"; "Stone Pike."*

This darter is known locally as "sand pike" or "stone pike." It was found in considerable numbers in Clear Creek, near its mouth.

**29. Etheostoma cœruleum** Storer. *Blue Darter; Rainbow Darter; Soldier-fish.*

Only three examples of this beautiful darter were obtained.

**30. Etheostoma flabellare** Rafinesque. *Fan-tailed Darter.*

Several examples of this darter were obtained near the mouth of Clear Creek.

**31. Cottus ictalops** (Rafinesque). *Blob: Miller's Thumb.*

Not uncommon in Clear Creek. Called "devil-fish" or "flying-fish" by a local fisherman.

## MOLLUSKS OF CHAUTAUQUA LAKE.

No special effort was made to collect the mollusks inhabiting this lake, and the following list is therefore far from complete. The little collecting that was done was on the northwest and north shores.

Species of *Unionidæ*, especially the heavy-shelled forms, do not appear to be very abundant, either as to species or individuals. *Campeloma*, *Planorbis*, *Limnæa*, and *Physa* seem abundant, and *Unio gibbosus*, *Anodonta grandis footiana*, and *Lampsilis luteolus* were the most common species of mussels. *Vivipara contectoides*, which is so abundant in many of the small lakes in northern Indiana in the Wabash Basin, was not found in Chautauqua Lake.

For assistance in the identification of the shells we are under obligations to Mr. Charles T. Simpson, of the Department of Mollusks, United States National Museum.

### UNIVALVES.

1. *Campeloma decisum* Say. Common.
2. *Valvata tricarinata* Say. Only one specimen obtained.
3. *Planorbis trivolvis* Say.
4. *Planorbis campanulatus* Say.
5. *Planorbis bicarinatus* Say. Two specimens.
6. *Limnæa palustris* Müll. Common.
7. *Physa ancellaria* Say. Common.

### BIVALVES.

8. *Sphærium rhomboideum* Prime.
9. *Sphærium striatinum* Lam.
10. *Sphærium sulcatum* Lam.

The second and third of the above three species were more common than the other.

11. *Anodonta grandis footiana* Lea.
12. *Unio gibbosus* Barnes.
13. *Lampsilis luteolus* (Lam.).
14. *Strophites undulatus* (Barnes).
15. *Strophites edentulus* (Say). This may be *Strophites undulatus*.