

26.—HABITS OF THE SHAD AND HERRING, AS THEY APPEAR IN THE POTOMAC RIVER TO ONE WHO HAS WATCHED THEM FOR FIFTY YEARS.*

By PEARSON CHAPMAN, Sr.

The Glut shad make their appearance in the river, say at Mathias Point, about the 10th of March, and would increase in numbers until the 1st of April if not disturbed. During or about the last of the month of April they commence depositing their spawn, always, as I believe, on hard gravelly beds, rocks, logs, and even anchors when at the bottom for a few hours. I have never hauled mud up with spawn in it. After spawning each individual returns to salt water.

In the month of May another species of shad, commonly called the May shad, makes its appearance. It is very short, thick, and stout, remarkable for the smallness of its body just before it branches off into a tail, fat and well flavored. This species of shad is nearly extinct, owing to the gill-nets. In the month of June, in addition to the above, we have a very large and stout shad, the flesh remarkably white when split open and soaked in clean water. It looks somewhat as if saturated with milk, but is so soft, mushy, and tasteless that one would hardly want to eat it.

What shad feed on in the Potomac I cannot say. When I reflect on the immense numbers that visited our waters fifty years ago, I almost venture the assertion that they do not eat at all, for there could not have been food enough for half the number. Yet when their stomachs are examined we find a substance not unlike black mud. In the month of September the young fry are in great numbers playing along the shores on their way down. Immense numbers are caught up in gauze seines for bait. They are then about the length of a man's finger, and from that down to the smallest minnow. I am fully persuaded that they come back to where they were spawned, but when I cannot say, though I believe immediately after the third year. I have often seen young shad not more than 9 or 10 inches long caught in a seine. What they were doing among their elders I know not.

The Branch or Blear-eyed herring is so called from its peculiar eye, which looks as if it had been seriously injured a month or so ago and was just healing. Some might doubt whether these can see at all. These make their appearance about the same time the first shad do. They go into the creeks and thence up in the branches (hence the name), and sometimes as far up as they can flutter over the gravels in order to deposit the spawn.

The Hickory jack (Hickory shad or Taylor) go there also, and about the same time and for the same purpose. May not the immense size of

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the Branch herring, as compared to the Glut herring, and the bad flavor arise from the mixing of the spawn? They taste as much like a Hickory jack as a Glut herring, and from the above facts I strongly suspect a cross. They do not diminish in numbers on account of the war made on the herring by man as other herrings do. May not that arise from the fact that their spawn in the branches is not disturbed by gill-nets and otherwise as is that of the Glut herring in the river?

The Glut herring is but little more than half the size of a full grown Branch herring and is far superior in flavor. It has a small, round, black eye, and never ascends the branches. Fifty years ago we had five distinct gluts or varieties of herring. First, the Branch herring. Second, the common Glut herring, early in April, afterwards later in April, and for the last three years (1875) not at all in April. Third, the Poplar-back, named from the fact that their backs were the color of yellow poplar. There are none to be seen now. Fourth, the Dumbellies, so called from the fact that their sides have a yellowish appearance as if gold dust had been sprinkled over them and then rubbed in. A few of those remain yet. Fifth, in the latter part of the season, which formerly began the 10th or 15th of May, we were regularly visited with a small, fat, and delicious herring called the "May Flipper," owing to the fact that they jumped and flipped the water higher than any of the rest. That fish no longer appears in gluts. I occasionally see a few with other kinds. I have always thought this due to the young herring coming on a year sooner than they now do, for they were exactly like them.

Our fisheries for the last fifty years have been gradually growing later. Then the shad and herring fisheries commenced about the 15th to the 25th of March and ended about the 1st of May. Now they commence a month later and end about the 25th of May. For the last thirty years there has been a gradual decrease of fish in the Potomac, owing, as I believe, to two causes—first, the immense quantity taken out, principally by the gill-nets; secondly, by the dragging of seines and gill-nets over the bottom, destroying the spawn. A giller will tell you that his net does not reach to the bottom, but a few figures will disprove that assertion. In the first place they have to sink their nets some 15 feet below the surface, letting them down with cords and cork, in order to allow the large coal vessels to pass over without hanging the nets. Then the seines are at least 20 feet deep, and the average depth of the Potomac is about 25 to 30 feet. At Fort Foote, Fort Washington, the White House, and just above Indian Head, the river spreads out very wide, and becomes shallow from Indian Head downwards. It is equally as certain that the lead-line of a seine destroys all the spawn that it comes in contact with. There are now 24 seines in all. Now, let us suppose that they will average 100 acres each, and destroy every spawn deposited thereon. There are 2,400 acres upon which the spawn is entirely destroyed. The estimate is that there are 500 gill-

nets, one-half of which are fine. These all drift about five miles up the river and five miles down, dragging on the bottom with from 5 to 10 feet of net all the while, and of course disturbing the spawn all the way. Now which is the most destructive, the seine drifting about a mile and the gill-net five, 24 of the one and 500 of the other, the seine fishing lasting five weeks and the gill-nets three months? The seine catches an immense number of cat-fish, eels, and mullets, which follow the fish to prey on the spawn. The gill-nets only aid them in exterminating the shad and herring. The best evidence of the destructiveness of the gill-net is the fact that in all the rivers to the north of us where they were introduced years ago they have first destroyed the seines and then exterminated the fish.

All our fish have decreased perceptibly within the last half century except the perch. That has held its own. May not that arise, first, from its pluck and courage in battle, and, secondly, from its spawning habits? The male clears out a spot about the size of a barrel-head; he removes everything offensive, and by some means causes the sand to look bright, clear, and as if gold dust had been sprinkled over it. Then he goes off in search of a female, and drives, coaxes, or persuades her to his parlor. Then you can see them going around in a circle, and woe to the fish that comes too near. I think the place selected is always in shallow water, and out of the way of all enemies. It occurs in June after the seines have all stopped.

The flounder has become nearly or quite extinct here. It has no enemy that I know of except the war loon and kindred ducks—the goggler, for instance, which frequently kills itself by attempting to swallow a flounder backwards, for such is his greediness that I have found as many as seven flounders in the throat of one dead goggler, the first one having been swallowed backward or tail first. The goggler is smaller than the war loon, and has a tuft of bristles on the top of its head, and can dive a great ways.

The Virginia or winter shad I never see in our waters or hear of now, thanks to our winter fishermen. I think it is a very indifferent fish, and would not be eaten if we could get a better at that time.

The gar is nearly extinct. I was talking with "a down-river giller" this summer (1875) on the subject, and he informed me that gars were exceedingly troublesome by hanging in their nets, and that they killed the gars by thousands. Formerly they threw them overboard after killing them, but it was soon found that they gave a troublesome hang to their nets, and now they uniformly keep them in their boats until they go ashore. Sometimes their boats get so overloaded that they have to quit their nets and go ashore to get clear of them.

The sturgeon also is becoming very scarce. A man has been fishing for them opposite me all the summer, and three a week is about the measure of his success. Forty or fifty years ago, with such a net as he has, he could have loaded a small boat in three hours. But the great-

est decrease of all, as I have said, is in the shad and herring. At the time named above it was not uncommon to take at a single haul fish estimated at from *two to three hundred thousand*. Of course they were not counted, for they were unmanageable. Now from ten to twenty thousand is considered a great haul.

DECEMBER 22, 1875.

27.—EFFORTS IN TROUT-CULTURE.

By B. F. DOWELL.

For nearly two years I have been experimenting in trout-culture a little near Portland, Oreg., and I have great hopes of making the business profitable after a while. I have a large spring within 4 miles of Portland, that offers 54 inches of water under a 6-inch pressure. The water is 49° F. at the springs and 52° in the ponds at the hottest time in August.

I have the Silver and Rainbow trout, and I am mixing them, and I would be glad to get some of the German saiblings.

JACKSONVILLE, OREG., *November 7, 1883.*

28.—NOTES ON THE SCOTCH FISHERIES.

By T. F. ROBERTSON CARR.

[From a letter to Capt. J. W. Collins.]

A 6-foot Greenland shark was caught last week on an Eyemouth line. The species *Heamargus borealis* rarely travels into these latitudes. A gentleman cruising at the mouth of the Tay counted over 90 seals on a bank there. This, also, is an unusual sight. A haddock 30 inches in length, 18 inches girth, and weighing 10 pounds, was landed by a Stonehaven boat. Haddock of this size were, some years ago, plentiful, but are now rarely to be seen. Both trawlers and line fishermen have had heavy catches of cod, ling, haddock, and flat fish. Both as to size and quality, all are agreed that this season's fish are rarely surpassed.*

EDINBURGH, SCOTLAND, *February 12, 1884.*

* The last paragraph is all the more interesting at this time when so much testimony has been given by Scottish fishermen to the Royal Commission to show that trawling is destroying all kinds of fish and breaking up the fisheries.—J. W. C.