

XLII.—SUMMARY OF REPORTS FOR 1878, BY STATE FISH COMMISSIONERS RESPECTING THE INCREASE OF FOOD FISHES BY ARTIFICIAL PROPAGATION.\*

MAINE.

*Atlantic salmon.*—The results of our salmon planting have been most satisfactory, as exhibited on the Penobscot, Androscoggin, St. Croix, and Medomac. On the Penobscot the yield has been very large. Perhaps no better summary can be given than the paragraph we here quote from the Bangor Commercial :

“The salmon fishers must now cease their fishing, as the close time for this season commenced to-day. The run has, in the main, been quite large. There was a time early in the season when they reached the remarkably low price of 8 cents a pound at Bucksport, but, as a rule, the prices have been good. A good deal of money is brought to the Penobscot Valley by this important industry.”—July 15.

Since July the number of salmon on the east and west branches has been reported to us as very large by the river drivers. Parties of excursionists have likewise represented young salmon as being very numerous, and annoying much by their numbers, and rising to their flies when fishing for trout. On the St. Croix the yield was large for that river. It may be remembered that in 1873 we transported 10,000 salmon fry to Vanceboro, which we turned into the St. Croix at that place. In 1874, 50,000 salmon ova were hatched for us in the hatching-house of the Dobsis club, and turned into the St. Croix tributaries. We think the inference is fairly deduced that these contributions have materially added to the stock of the river. On the Androscoggin a good many salmon have been taken the last two or three years. Mr. Ambrose T. Storer, the fish warden at Brunswick, writes under date of August 25, 1878: “I have tried to ascertain the number of salmon caught on the Kennebec, but was unable to learn the exact number, but think it larger than usual. Mr. Trott caught seven in one day. I don't know how many have been caught in the small rivers tributary to the Androscoggin, but on this river the number caught by our fishermen was fourteen, which is more than has been caught before for some years. I

\* The report of the commissioners of New Hampshire for 1878 contains an excellent summary of general results of fish culture by the States, from which numerous extracts have been made and inserted under their respective headings. The selections for this article have been made by Mr. C. W. Smiley.

have been hoping to see the fishway completed." Another gentleman writes: "Brunswick, July 6, 1878. I have the pleasure of informing you that a fine large salmon has been the admiration of many of our citizens, playing around above the falls near the short bridge. He was so tame that some one undertook to catch him by a spear or hook, and by that means wounded him, so that he was this morning found dead. Of course no one knows who did it, but it was learned with manifold regret though his existence establishes the fact that we have young salmon in our river. Now, if we had good fishways in good condition on our falls, there is no doubt but that we would have a plenty of these beautiful fish in our river." Still another, under date of July, 1878, says: "Can anything be done by us to enable you to have our fishways made more practicable?"

On the Medomac, "large salmon have been seen jumping in the basin, above the dam, where such a sight has not been witnessed before for forty years." (Twelfth report of the commissioners of fisheries of the State of Maine, for the year 1878, p. 8-9.)

*Alewives.*—We transported seventy alewives in cans from Bucksport to Enfield, part way by wagon and the rest by railroad, on the 17th of May. The 10th of September the first school of young fry were seen on their way down to the Penobscot; two other schools followed at intervals of a few days. These fish, it is estimated, will make their first return from the ocean in two years. (Twelfth report of the commissioners of fisheries of the State of Maine, 1878, p. 17.)

We quote from several of their recent reports, as follows:

Maine says: "The salmon fisheries of the State have been largely productive, that of the Penobscot being reported as greater than for the last twenty-five years. The take of alewives in those parts of the State where fishways have been provided and the fish protected was likewise very large and remunerative. The most gratifying feature of this year's experience is the wide interest awakened in the State in fish culture among all classes, as evidenced in the extensive demand for brook-trout, land-locked salmon, and black bass to stock waters for private enterprises, as well as for towns and counties. The black bass we apply in all cases as an antidote to the worthless pickerel. It costs more to feed a pickerel than any other fish; it costs more to make a pound of pickerel than a pound of any other fish; the pickerel consumes everything that swims or that it can swallow; it is very destructive to young water-fowl.

"For the last four or five years large numbers of young salmon have made their appearance in the Penobscot River below Bangor. Even the Kenduskeag River, below Morse & Co.'s mill, has been full of them. Large numbers have been taken this year below the dam of the Holly Water-Works, at Treat's Falls, and in Barr's Brook, by both men and boys. In dipping for smelts in Brewer, sixty young salmon were picked from among the captured smelts in the course of two hours and returned to

the water. They were recognized by an intelligent bystander and their distinctive marks pointed out, when all parties immediately took a deep interest in protecting them. One man, in fishing for suckers in the Kenduskeag, with coarse line and baited hook sunk on the bottom, caught sixteen young salmon in two hours, and carefully returned them to the water again. The Bangor Commercial says: 'On visiting his weir yesterday in Marsh River, Mr. Reuben Hopkins found one hundred and forty young salmon in it, varying from 8 inches to 1 foot. He turned them all loose in the river. We learn that these young salmon are found in all the weirs in the river in large numbers.'

"The salmon fishery of the Penobscot is estimated to be the largest for many years, so much beyond the product of years past as to leave no doubt in the minds of the most incredulous that the work of restoration by planting and protection is an entire and unmistakable success. Many of the salmon were of very large size.

"Of one of the large fishes the following paragraph, cut from the Belfast Journal, will be read with interest, as conveying some important facts in relation to their growth and habits: 'In our issue of May 3, we made mention of a very large salmon caught at Cape Jellison, Stockton, by Josiah Parsons, and purchased by Frank Collins, of this city. The fish measured 50 inches in length and weighed thirty-three and one-half pounds. Attached to the fish was a metallic tag, numbered 1019, indicating that it was one liberated from the Bucksport breeding works. The tag was forwarded to Mr. Atkins, the superintendent of the works, who keeps a record of all fish used for spawning purposes and then liberated. We now chronicle the record of the fish as learned from a letter from Mr. Atkins to Mr. Collins. He writes that the salmon was liberated at Bucksport, November 10, 1875. It was a female fish, 39½ inches in length, and yielded five pounds and six ounces of spawn, or about 16,000 eggs. After spawning it weighed sixteen pounds. He judges that in the preceding May (1875) the fish weighed twenty-five pounds; thus the fish in two years had grown nearly an additional foot in length and eight and a half pounds in weight. One important fact in the habits of the salmon has been demonstrated by the use of these tags, and that is that the fish, after it becomes large, does not visit the river every year, as was formerly supposed, but only every second year. Those liberated in the Penobscot in 1873 were caught again in 1875, and those let loose in 1875 are now being caught. One dollar premium is paid for every tag thus found. Among others of the large fish, one was taken at Veazie, by Mr. Albert Spencer, weighing 38 pounds. The salmon presented by our worthy mayor, Dr. A. C. Hamlin, to Mayor Prince, of Boston, and which was captured at Sandy Point on the Penobscot, was said to have weighed forty pounds when first taken. A very good run of salmon has visited the St. Croix the last year.' (New Hampshire fish commission report for 1878, pp. 25, 26, 27.)

"In 1873 some thousands of young salmon were turned loose by us in

the St. Croix at Vanceborough. In 1874, 50,000 fry were hatched and turned into Dobsis stream for us by the courtesy of the Hon. Harvey Jewell, of the Dobsis club. The inference is but fair that these contributions to the stock of the river had a marked influence in adding to the number that constituted the good run of this year." (New Hampshire fish commission report, 1878, p. 27.)

#### NEW HAMPSHIRE.

*Atlantic salmon.*—More salmon were seen during the summer at Amoskeag Falls than were noted in the fish-way at Lawrence; and a pair of very large ones, estimated by Mr. Kidder at sixteen or seventeen pounds each, were seen about September 1, and a similar pair were seen by Mr. Powers, jumping the falls above the hatching-house, September 15. (Report of the fish commissioners of New Hampshire, 1879, p. 4.)

"Atlantic salmon, 7 inches long, of the planting of 1876, were so plentiful up to about the middle of August that it was impossible to fish without frequently hooking them. Mr. R. R. Holmes actually hooked three at one cast, and remarked that the river was alive with them. In August they began to disappear, and at this date very few are seen. On the 6th of November I dipped up a small Atlantic salmon, about 3 inches long, at the outlet of the hatching-house brook, which must have resulted from last year's run of salmon in this river, as there has been no plant since 1876, which, as above stated, have grown to the length of 7 inches." (Report of the fish commissioners, New Hampshire, 1879, p. 11.)

*Quinnat salmon.*—"The California salmon fry turned into the river in 1878 were very numerous up to the last of July, and had grown to the length of about 3 inches. On the 20th of June they were so plenty as to be seen in numbers in any locality near the hatching-house." Report, p. 11.)

*Salmonida.*—"L. D. Butler, of Woodbine, writes March 23, 1877: 'The California salmon, planted in our streams last February a year ago, are now from 7 to 9 inches long. One of the former plant was caught that weighed one and a half pounds.'

"A. A. Mosher, of Spirit Lake, writes March 13, 1877: 'The fish you sent us last year are doing wonderfully well. They are now about 7 inches long and take to these waters.'

"Large numbers of letters and newspaper paragraphs of this kind are in the possession of the commissioners, and these are given only as samples, while great numbers of people have given testimony as to having seen and caught the young fish.

"Mr. E. Bush, station agent, reports the catching of a dozen salmon, weighing two and a half pounds each, in the North Fork of the Maquoketa.

"The principal of the high school at Marion reports catching a half dozen, weighing from one and a half to two pounds each.

“Dr. French reports having seen one at Davenport that would weigh two and three-fourths pounds.

“George Brown caught two in Wapsic that would weigh one and a half pounds each.

“Mrs. H. Ruble has in her pond at North McGregor a number of Penobscot salmon, three years old, some individuals of which will, it is estimated, weigh ten pounds. They have never been out of the pond they are now in, and, notwithstanding their confinement in fresh water, are perfectly healthy and hearty, and as fine a sight as it is possible to conceive of.” (New Hampshire fish commissioners’ report, 1878, p. 31.)

“As the salmon did not loiter, but passed quickly over, it is fair to conclude that hundreds passed up unnoticed; and this conclusion is confirmed by well-authenticated reports of the large number seen at Manchester as well as all along the Pemigewasset.

“Mr. Tomkinson, of Livermore Falls, counted twenty ascending the rapids in about two hours. Indeed, so common a thing was it to see them scaling the falls, that the White Mountain stage frequently stopped on the bridge to allow the passengers to see them. Mr. White, of Boston, who spent the summer at the Profile House, reports having seen, in one pool, thirteen large salmon from 2½ to 3 feet long.

“The report shows that forty-seven salmon were found in the fish-way during an examination of thirty-minutes a day for twenty-eight days. If we assume the running time at twelve hours a day, the total number that passed over would be in this proportion, 47 by 24=1,128 salmon, to which must be added a certain number that passed over in October. Taking the weights as roughly estimated, we may say that about one in seven were rather small fish, of about eight pounds; one in seven were large fish, of fifteen pounds or more; and the great majority, or five in seven, were medium salmon, of ten or twelve pounds.

“The following table will show the dates at which the batches of parrs were put in the river and their respective ages up to the spring of 1877:

Put in the river.	1873, spring.	1874, spring.	1875, spring.	1876, spring.	1877, spring.
Spring 1872, 16,000 parrs .....	1 year old...	2 years old..	3 years old..	4 years old..	5 years old.
Spring 1873, 185,000 parrs .....	1 year old ..	2 years old..	3 years old..	4 years old..	4 years old.
Spring 1875, 230,000 parrs .....	.....	.....	.....	1 year old...	2 years old.
Spring 1876, 400,000 parrs .....	.....	.....	.....	.....	1 year old.

“The few salmon of fifteen to eighteen pounds that ran up may have been of the batch of 1872; the smallest, of six and eight pounds (including those of the October run) may have been late or under-fed fish. Evidently the bulk of the salmon were of the plant of 1873, because the sixteen thousand parrs put in the year previous could not by any calculation have furnished one-fifth of the adult salmon that returned in 1877.”

“PLYMOUTH, February 22, 1878.

“SAMUEL WEBBER, Esq.:

“DEAR SIR: It is with pleasure that I answer your inquiries in regard to the salmon that came up the Pemigewasset River this season. And at the same time allow me to congratulate you upon the complete success that has attended the labors of the Massachusetts and New Hampshire commissioners in their attempts to restock our beautiful river with the king of fish, the *Salmo salar*.

“The work is no longer an experiment, but an assured success, as not a single salmon has been seen in the Pemigewasset until this year since the erection of the dam at Lawrence some thirty years ago. That they have returned this year in large numbers is beyond a doubt. And this fact must be a source of congratulation to the gentlemen who had charge of the work of transferring the young fry from the hatching house at Winchester to the headwaters of the Pemigewasset and Baker's Rivers, as they no doubt will remember the discouragement and even ridicule they met with from the time they would leave Winchester until the cans were emptied into the river. It is impossible to say at what time the first salmon made their appearance at Livermore's Falls, as no one was looking for them.

“On my return from New Brunswick the last of June, I learned that the salmon were passing the fish-way at Lawrence. I immediately requested the Messrs. Tompkinson, at the falls, to watch for them. The first one was seen about the 1st of July. It was a full-grown fish about 3 feet in length, and for several weeks following there was hardly a day but what they could be seen in their endeavors to pass over the falls. I have counted from eight to ten in an hour, but do not think they were different fish, for it was very seldom that one would pass the rapids at the first attempt. Many of them would make leaps of 10 to 15 feet and pass up, but if they fell short of that they would be carried back into the pool below. It is impossible to say how many passed the falls, but there must have been some hundreds. They were seen all along the river as far up as the Woodstock dam, but as far as I can learn, and I have made careful inquiries, none have been sent above that point. The young salmon went many miles above there this season.

“Full-grown fish, that is, from 2 to 3 feet in length, were seen by many from the bridge in this village during July, and at the falls as late as November.

“There must be more stringent measures taken to prevent the destruction of the small salmon by fishermen, as they were taken by hundreds this season.

“I remain, respectfully, yours,

“E. B. HODGE.”

We have given Mr. Hodge's letter exactly as received, but other advices lead us to believe that the heavy rains of the first week of September, 1877, carried away so large a part of the dam at Woodstock as

to give a free passage to the large salmon, thus allowing them to ascend the river nearly to the Profile House, as stated in the report of the Massachusetts commissioners.

Mr. Tompkinson's letter is interesting as giving positive details of his observations, and from it we quote as follows:

"The first of our seeing the salmon go up through the Livermore Falls was in the early part of July, 1877, when our attention was called by Mr. Hodge to see if we could see any salmon going up the falls. The first day we saw seven, at four different times during the day, stopping only about ten to twenty minutes each time. This was the first day we began to look for them. We reported the same to every one that came along. Almost every day afterward, for about six or seven weeks, there were salmon seen. The largest number in one day (seen by my brother) was twenty. I myself saw five go up in forty-five minutes. We never lost much time in watching for them, as we could not afford to lose any time, for we have so much work on hand. I saw eleven on another day in about two hours. On another day my brother saw seventeen in about two hours. We never stopped a whole day to watch at one time, but state what we have seen. The above were seen about the 20th of July. The largest one my brother saw was nearly 3 feet long, and he was within 8 feet of it when he saw it. \* \* \*

"Yours, most truly,

"J. R. TOMKINSON."

We must now go back a little in our dates to connect the thread of our story. Early in June we were notified by Mr. Brackett, of the Massachusetts fish commission, that salmon were passing up the fish-way at Lawrence.

The dam at Lowell had recently been rebuilt, discarding the old fish-way, but running the north end of the dam on to a gently-sloping ledge in such a manner that it only needed to take off one flash-board to leave an easy passage 10 feet wide, with 12 or 16 inches depth of water, over a fall of about the same height, and the fish found no difficulty in passing it; so that on the 13th of June we were notified by Mr. Kidder, the keeper of the gates and locks of the Amoskeag Company at Manchester, that he had secured for us the first salmon seen at Amoskeag Falls for thirty years. We had requested Mr. Kidder to look out for the first fish that came up and let us know, and he had done so literally. The fish was a male, apparently of four years of age, two feet four inches in length and a half inch in depth, and weighed eight pounds and five ounces.

Mr. Kidder unintentionally transgressed the law in his anxiety to please the commissioners, but his fine was settled by his many friends in Manchester, and the salmon that followed were allowed to pass "free of toll." Within a week from the capture of this first one a report was brought us by Conductor Colby, of the Concord Railroad, of a large salmon having been seen at the mouth of Martin's Brook, four miles

above Manchester; and almost daily after that date we heard of them farther and farther up the Merrimack River. (New Hampshire fish commission, 1878, pp. 6, 7, 8, 9, 10.)

"In addition to the above record there was a full run of salmon, which commenced October 11 and ended October 30. These fish, so far as seen in the way, were from six to ten pounds in weight. Much larger ones may have passed over, as Mr. R. R. Holmes saw one 3 feet long near the hatching-house, at Plymouth, the 1st of November." (New Hampshire fish commission report, p. 6, 1878.)

#### MASSACHUSETTS.

*Schoodic salmon.*—Some of the land-locked salmon received from Maine were turned into Halfway Pond in Plymouth. The returns received from many of those who had charge of these fish are very favorable. It is quite certain that they are well established in Halfway Pond. And in Mystic Pond, situated in Medford and Winchester, where they were first introduced, they are appearing in considerable numbers. On the 11th of September a land-locked salmon, 22½ and a half inches long and weighing three and one-quarter pounds, was caught in Lower Mystic Pond by a boy while fishing for perch. The boy, not knowing what it was, sold it to J. P. Richardson, of Medford, who forwarded it to the commissioners for identification. A careful inspection of the pond, made in October, showed quite a large school of them, weighing from two to eight pounds each, at the mouth of one of the streams entering the pond. The large fish are probably the Sebago salmon, put in about six years ago. One of the persons making the inspection hooked one of them; but, being in a small cloth canoe, barely large enough to carry one person, and having the fish on a light fly-rod, he found it impossible to get him into the boat; and, in attempting to reach the shore, the salmon recovered himself, and with a sudden leap left hook, line, boat, and fisherman behind him. (Thirteenth annual report of the commissioners of inland fisheries for the year ending September 30, 1878. 8vo. pamph., Boston, 1879, paper, p. 13.)

*Atlantic salmon.*—Our experience with young salmon in the Merrimack shows pretty conclusively that they do not go down to the sea until the third year. The salmon put in the river in 1876 have been carefully watched, and were found to be very numerous all along the river, especially near the mouths of trout brooks, showing no disposition to change their quarters until about the middle of last August, when they began slowly to move downstream. (p. 18.)

Atlantic salmon, 7 inches long, of the planting of 1876, were so plentiful up to about the middle of August, that it was impossible to fish without frequently hooking them. Mr. R. R. Holmes actually hooked three at one cast, and remarked that the river was alive with them. In August they began to disappear, and at this date very few are seen. On the 6th of November I dipped up a small Atlantic salmon, about 3 inches



long, at the outlet of the hatching-house brook, which must have resulted from last year's run of salmon in this river, as there has been no plant since 1876, which, as before stated, have grown to the length of 7 inches. (p. 19.)

*Quinnat salmon.*—The California salmon-fry turned into the Merrimack River in 1878 were very numerous up to the last of July, and had grown to the length of about 3 inches. On the 20th of June they were so plenty as to be seen in numbers in any locality near the hatching-house. (p. 19.)

*Condensed report of Thomas S. Holmes, of fish found in the Lawrence fish-way from May 1 to August 1, 1877.*

May 31. Two salmon, 12 to 18 pounds each.

June 2. Two large shad.

3. Three large shad.

4. One salmon, 12 to 18 pounds.

10. Two 12-pound salmon.

11. One 8-pound salmon.

12. Two 6 to 8 pound salmon.

13. One 10-pound salmon.

14. One 8-pound salmon.

15. One 8-pound salmon.

16. One 10-pound salmon.

19. One 18-pound salmon.

20. One salmon.

22. One 8-pound salmon.

23. Three 12-pound salmon.

25. One 10-pound salmon.

26. One 12-pound salmon.

28. Two 8-pound salmon.

29. One 10-pound salmon.

July 1. One 12-pound salmon.

2. Two 10 or 12 pound salmon.

3. Two 10 or 12 pound salmon.

4. Four 10 to 15 pound salmon.

6. Five 8 to 18 pound salmon.

7. One salmon.

9. One 12-pound salmon.

12. One 8-pound salmon.

From this to the 23d no salmon.

23. Three 8 to 12 pound salmon.

30. Two large salmon.

(Extract from the twelfth report of the fish commissioners of the State of Connecticut, 1878, pp. 10, 11.)

STATE OF MASSACHUSETTS,  
DEPARTMENT OF INLAND FISHERIES,  
Winchester, Mass., October 12, 1877.

MY DEAR HUDSON: The rise in the river has brought another run of salmon, which are now passing over the fishway at Lawrence. There seems to be no end to our success on the Merrimack.

Yours, with sincere regard,

E. A. BRACKETT.

RHODE ISLAND.

*Atlantic salmon.*—We have to report that a good many salmon have been taken in the past two years that we have record of, and no doubt many more unreported.

The largest weighed ten pounds, and was taken at the foot of the falls, at Pawtucket, last June. Smaller ones were taken in the Pawtuxet, between the first dam and Pontiac, and a number near Westerly, below the first dam on the Pawcatuck; none larger than two and one-half pounds. (Eighth report of the fish commissioners of the State of Rhode Island, 1878, p. 4.)

CONNECTICUT.

*Atlantic salmon.*—Under date of June 18, 1878, Mr. D. W. Clark writes from Saybrook, Conn.:

“The first salmon caught this season was taken in a gill-net, April 30, and weighed 12 pounds. From that time to May 25 salmon were caught more or less nearly every day. Since May 25 they have been more scattering, so that from that date to June 18 but three have been taken. The above number does not include any that the pounds have liberated when caught, but those only which have gone to market.

“The average weight of those caught has been about fourteen pounds. The whole number taken up to this date in the towns of Saybrook and Westbrook is forty-five, of which three-quarters were caught by gill-nets on the river and one-quarter in seines on the river and pounds on Long Island Sound.”

Under date of July 12, 1878, Mr. Clark again writes:

“I give you full results of the season of 1878. The salmon caught by the pounds and put back into the water may be given as about twelve, and the whole number caught by pounds as about thirty. In the river the salmon caught by gill-nets were almost all taken while the water was thick with mud in freset. Experience this season proves that the gill-nets are not sufficiently strong for taking salmon, nor are they of the right-sized mesh. The fishermen found many torn places in the nets, which had the appearance of being caused by salmon. When these fish are caught the nets are hanging slack in the water and the fish are caught by many folds of twine. But when the current is strong and the meshes are all drawn the salmon easily break through.

"I have been unable to obtain the number of salmon caught by gill-nets in Lyme, but the dealers estimate them from seventy-five to a hundred."

The commissioners have authentic evidence that the greater portion of the salmon caught were sent out of the State. Not less than three hundred and twenty-two were sent to the New York markets, and they are reported as weighing about twelve pounds apiece on an average, and to be superior to every other salmon in the market. From all the facts which the commissioners have been able to gather, they feel no hesitation in asserting that over *five hundred* full-grown marketable fish were caught in and near the river during the past season, and with the exception of the few reported as returned to the water from the pounds, every one of them was destroyed; a most lamentable example of reckless improvidence and wastefulness. (Thirteenth report of the commissioners on fisheries of the State of Connecticut, 1879, pp. 5, 6.)

About a dozen salmon, weighing each from nine to eighteen pounds, have been taken in the Connecticut River or the pounds west of its mouth during the past season, but no information has been given your commissioners of even one having succeeded in passing above Portland. Great numbers of the young, from one to three years old, in good condition, have been seen in different parts of the river and some have been taken, specimens of which have been sent to your commissioners. (Page 10.)

#### NEW YORK.

*Trout, &c.*

DEPOSIT, October 26, 1877.

SETH GREEN, Esq. :

DEAR SIR: Yours of the 15th instant received. I have not had an opportunity to observe the condition of the brook trout placed near the head of the Oquago Creek, but those we placed in a little tributary near this place are doing well, and there are no reasons to doubt that the others are doing equally well. They were about 3 or 4 inches long when I saw them. The trout placed in the lake two years ago and last spring have not been heard from. I do not think there has been any fishing specially for them. There is no reason why they may not do well, as the water, depth, and bottom are adapted to that kind of fish. The black and the rock bass put in the lake six years ago last spring have increased wonderfully. A great many fine bass have been caught this fall, ranging from one-half to three pounds six ounces, the largest that has been taken. There will be fine fishing next year. A few have been taken in the Delaware; they probably came from the lake, as they were caught below the mouth of the outlet. We have succeeded in having a law passed removing the eel-weirs, which will make it an object to stock the river. I think it would be advisable to place a quantity of young bass in the river at this point this coming winter and spring; it would be better to place them in after the spring ice-freshet, if possible,

as they would not then be liable to be driven down the stream and killed by the ice-jams. The west branch of our river is equally as good as the waters in the main river at Port Jervis, where large quantities have been taken in the last three months. I should be pleased to hear from you, if you have any advice or suggestion. I shall take the first opportunity to examine into the condition of the trout in the creek, and will inform you if I find anything new.

Yours, respectfully,

F. STURDEVANT, M. D.

(Tenth annual report of the New York commissioners of fisheries, 1877, p. 45.)

COOPERSTOWN, *October 20, 1877.*

Friend GREEN:

DEAR SIR: Mr. Jarvis informed me that you would like to know about the fish we put into the streams and lakes. The salmon-trout are increasing very fast. One man took in one day, a-trolling, seven trout, the smallest weighing two pounds, the largest six pounds. Another man caught eight, and had a number of more near the boat, all in the same day. This was in June; and hundreds of smaller size were seen. The brook trout are all right and are doing well; also black bass. One man took four at once catch, and lost a number of more. We shall want some more whitefish and trout this winter. Hoping this will find you well, I remain as ever,

Your friend,

A. W. THAYER.

(New York fishery commissioners' report, 1877, p. 47.)

CORNING, N. Y., *October 20, 1877.*

SETH GREEN, Esq.:

DEAR SIR: Yours received, and in reply I would say the trout received from you are doing nicely in all the streams, and we expect to have fine trouting in this section again. The black bass are multiplying very fast in the Chemung River, and fine strings are taken below the dams here. The State dam is 8 feet high, and proves an obstacle that a fishway would overcome. The canal will probably be abandoned in another year; if not, the canal commissioners will be required to comply with the law.

Yours, respectfully,

J. H. WAY.

(New York fishery commissioners' report, 1877, p. 46.)

*Black Bass.*

OSWEGO, *October 16, 1877.*

SETH GREEN, Esq.:

DEAR SIR: Your postal card of the 15th instant, making inquiries as to what has been heard from the fish shipped us from the New York State hatching-house received, and I reply that the Susquehanna River stocked with black bass seems to be well stocked. There were a few

caught last year, but this year, I presume, there has been taken tons of them in the river within eight miles each way of this place. It does not seem possible that the fish put in here could have produced as many fish as there seems to be in the river. There seems to be no end to the bass. I have only been out once this year, and then a gentleman and myself caught 35, several of which would weigh at least two pounds each.

There have several been caught that weighed as high as three pounds and over.

As to the trout in the small streams, I cannot tell what they will come to yet, as it has not been long enough yet.

Yours, respectfully,

BARNEY M. STEBBINS.

(Tenth annual report New York fishery commissioners, 1877, p. 47.)

*Atlantic salmon.*

“PEEKSKILL, N. Y., March 11, 1878.

“I wish to mention the capture of a salmon, a true *Salmo salar*, in the Hudson, about two miles north of our village. It was taken on the flats this morning, near the mouth of Snake Hole Creek, just below Iona Island, in an ordinary seine, while its captors were hauling for perch and other small fish. It measured 33 inches in length and weighed but 8½ pounds, being in very poor condition, and presenting the appearance of having recently spawned. Small fish of this species have been taken through the ice during the past winter in T-nets, but nothing approached this in size. I regret my inability to forward you the fish, but it was disposed of before I saw it. Am I justified in supposing it to be one of the fry introduced into the upper part of our rivers a few years since?”

This confirms the observations of Mr. Atkins, that the salmon which spawn in the fall and winter of each year return to the salt water the year following, and again return to the fresh water the next year; so that while one stock of spawners will ascend the rivers in the even years, as in 1874, 1876, 1878, &c., another body of fish comes up in 1875, 1877, 1879, &c. (New Hampshire fish commission report, 1878, p. 29.)

*Shad.*—Forest and Stream says: “Syracuse papers of the 10th instant are congratulating Mr. Seth Green upon accumulating evidence of his success in cultivating shad in Lake Ontario. Very recently a fine male shad, weighing five and a half pounds, was caught in a gill-net, six or seven miles out in Lake Ontario, off Port Ontario, at the mouth of Salmon River. The fish is the largest of its kind yet caught in the lakes, and is one of those placed in its waters by Mr. Green in the year 1872. The attempt to introduce this fish in fresh water was an experiment. It is now no longer in the list of experiments, but a matter of certainty. The fish have been caught at various points on the lake ever since the fry were put in, and appear to grow as rapidly and possess all the qualities of the shad that are caught from salt water. (New Hampshire fish commission report, 1878, p. 29.)

## NEW JERSEY.

*Atlantic Salmon.*—No attempt has been made to capture any adult salmon which may have returned to our river, and it was not expected that they would make their reappearance until four or five years after they were placed in the stream. In the spring and summer of 1877, however, six or seven fish were taken in shad nets at different points on the river. They were medium-sized fish, averaging about ten pounds, but had evidently been to the sea and had returned to the river to deposit their eggs. This was deemed highly encouraging, and the next season was looked forward to with much anxiety by those who were interested in fish culture and who appreciated the immense importance of the success of the efforts to establish this valuable fish in the rivers of the State. On the 5th of April, in the present year, a magnificent salmon was taken in the Delaware River, within two miles of Trenton. This fish, which was three feet five inches in length and weighed twenty-three and a quarter pounds, came into the hands of the commissioners and was by them forwarded to Prof. Spencer F. Baird, at Washington, who addressed the following letter to one of the commissioners :

“ UNITED STATES COMMISSION FISH AND FISHERIES,  
 “ *Washington, D. C., April 11, 1878.*

“ DEAR SIR: You have rendered the United States Fish Commission a very great service by sending on the specimen of Delaware salmon as advised in yours of the 6th of April. It reached me in good condition Tuesday, and I have already had the pleasure of exhibiting it to the President, and the greater part of his Cabinet, and a number of members of Congress who are interested in such matters, and who came to witness the realization of the efforts made toward stocking the Delaware with this noble fish. I shall have a plaster cast made, colored from nature, and the specimen itself will be prepared and kept in alcohol in a jar of suitable size. I am waiting the result of a conference of some experienced salmon fishermen as to whether this is to be considered as a fresh-run fish from the sea, or a fish that has been in the river all winter, as is quite frequently the habit of salmon. The slight development of the hook of the jaw is rather an indication of the former supposition.

“ From the size of the fish, I incline to refer it to the lot of Rhine salmon of which about 500,000 eggs were imported in 1873, but which, owing to the unprecedented heat of the weather in Germany and on board the vessel, arrived in poor condition, only about 5,000 surviving, and being hatched out at Dr. Slack's place at Bloomsbury. These were introduced into the Musconetcong, and doubtless made their way to the sea. A fish of this weight would require five years for its growth.

“ I hope you will continue to gather all the data possible in regard to the occurrence of salmon in the Delaware, and that you may be able to detect among them some of the California salmon, which should be making their appearance.

"I am happy thus to open a communication with yourself as one of the commissioners of New Jersey, and shall take pleasure in acting with you in the promotion of the common work of stocking our rivers with useful food-fish.

Yours, truly,

"SPENCER F. BAIRD,

*"United States Commissioner of Fish and Fisheries.*

"To E. J. ANDERSON,

*"Commissioner of Fisheries, State of New Jersey."*

During the shad season, which closed below Trenton June 10, and above Trenton June 15, 1878, a number of salmon were taken by shad fishermen at different points on the Delaware. It has been impossible to procure information of all that were taken, but a sufficient number were reported to warrant the assertion that from fifty to one hundred were taken before June 10. All of those reported to the commissioners were larger fish than any of those taken in the preceding year, and ranged in weight from 12 to 29 pounds, only two or three weighing less than 15 pounds. After the shad season closed and the nets were taken from the water, there was nothing to interrupt the progress of the salmon from the sea to the headwaters of the stream, and doubtless many passed up and deposited their eggs, since the commissioners are informed of a number of large ones having been seen at different points in the river between Trenton and Port Jervis.

In the Raritan River, one large fish was taken near New Brunswick in the summer of 1878; but none have been reported as yet from the Passaic and Hackensack Rivers.

The facts above stated concerning the presence of salmon in the Delaware were deemed to go far toward demonstrating the success of the efforts to convert that river into a salmon stream. (Report of the commissioners of fisheries of the State of New Jersey, 1878, pp. 15, 16, 17.)

New Jersey makes a very favorable report of the general progress of fish culture. Shad are increasing in numbers, and very greatly in size and quality; and salmon have made their appearance in the Delaware, as mentioned by the Maryland commissioners, nine having been taken this year, though their report does not say whether they were Penobscot or California salmon, both of which have been planted. Two were taken at Newcastle in May; two at Riverton in May; one between Bordentown and Trenton in May; two at the Delaware Water Gap in October; one in October at Carpenter's Point, the extreme northwest corner of New Jersey, and one in the Bushkill in November. The fisherman who took the two at the Gap was ignorant of the species till informed by Mr. A. A. Anderson. The taking of the five last mentioned, in the fall, and so far up stream, some sixty or one hundred miles above tide, shows that they were seeking spawning-grounds at the headwaters of the river, and, if of the California variety, except the last, at the usual

season of their spawning. Whether others have been taken by persons ignorant of their kind, we know not. It is fair to suppose, however, that not all those that returned from the sea were taken. Many, measuring from 6 to 12 inches, have also been caught the past season with the hook.

The commissioners also report an enormous increase from the black bass that they have previously distributed in various waters, and excellent fishing obtained from this source. They have distributed nearly 10,000 of these fish this year, besides 4,230,000 shad-fry, 400,000 smelts, and 250,000 California salmon, and are now earnestly at work on fish-ways. (New Hampshire fish commission report, 1878, pp. 29, 30.)

#### PENNSYLVANIA.

*Atlantic salmon.*—The Free Press, of Easton, Pa., under date of November 10, 1877, says:

“We referred briefly yesterday to a salmon being captured in the Bushkill, and have since verified the report.

“The fish was discovered in Groetzinger’s mill-race, on the Bushkill, at the foot of Fourth street, and its unusual size immediately attracted the attention of a number of people, who resorted to various devices for its capture. Hooks and lines were used, and it was hooked but broke loose. It was also shot with bird-shot. This did not kill it. It was finally shot with a rifle by a young man named James Young, the bullet passing into its body and stomach just at the junction of the head and body, and the strange fish was secured. Mr. Young presented his prize to his uncle, Mr. J. E. Stair, and it was very generally believed to be a salmon. Mr. Stair appreciated its important bearing on certain mooted points of the history and habits of this fish, and, in the interest of fish culture, thoughtfully placed it at the disposal of Fish Commissioner Howard J. Reeder.

“The point at issue with scientific men, referring to salmon, is whether this fish placed in rivers as far south as the Delaware and Susquehanna will, with the instinct of their class, return to the grounds where they were hatched, and as nothing but experiment will prove this, the importance of all evidence bearing upon the controversy will be realized. At different times during the past four years a great many thousand salmon eggs and salmon fry have been deposited in the Bushkill and Delaware Rivers, under the supervision of Commissioner Reeder, and at various times reports have been circulated of salmon of considerable size being caught at Bordentown, Trenton, Carpenter’s Point, and other points on the Delaware, ranging from five to eight pounds weight; but, unfortunately, these have fallen into the hands that did not perceive anything in the fact beyond the table, and their evidence was lost to the scientific world. But this fish is a fact, and in official hands will be irrefutable evidence that the stocking of our rivers with the most valuable fish in the world is not visionary, but practicable.” (Report fish commissioners Pennsylvania, 1878, p. 9.)



## MARYLAND.

*Atlantic salmon.*—We were not hopeful of any results from the introduction of the salmon of Maine, as it has been known only in the coldest waters. We, therefore, devoted our attention rather to the salmon of the Pacific slope, which, on the contrary, were known to ascend rivers in which the water at times reached a very high temperature. Contrary to our expectations, the true salmon have returned to the Delaware River in some abundance, a great many adults having been taken during the last two years in this river. On the night of the 11th of May Mr. Frank Farr, one of the gillers of Havre de Grace, who had been in the habit of furnishing us with the ripe shad taken in his gill-net, secured the first adult Atlantic salmon of which we have any record taken in Maryland waters. This fish was a female, measuring 3 feet 4½ inches, and weighing about seventeen pounds, fresh run from the sea.

The fish was captured off Spesutie Island, having been entangled in the gill-net, which was much torn; and Mr. Parr, who captured it, is confident that at least one other fish accompanied the one taken, but made its escape.

The gillers are in the habit of having their nets much torn by sturgeon, and no doubt have attributed to them many casualties which may have been occasioned by salmon. (Report Fish Commissioners Maryland, 1879, p. xiv.)

## VIRGINIA.

*Salmon.*—“To us in Maryland of more importance is the reappearance in the Delaware of salmon of both varieties, the *Salmo salar*, of the North Atlantic, and the *Salmo quinnat*, of the Pacific. I have received authenticated accounts of the capture of one weighing eight and a half pounds, at Newcastle; one weighing eight and a quarter pounds, at Riverton; and one weighing nine pounds, taken between Bordentown and Trenton; and have myself seen a large female Penobscot salmon, with the mature eggs running from her, which was taken at Easton in the act of spawning; and there have been several others reported, even weighing as high as twenty pounds. These indications of the successful introduction of salmon into the Delaware, commenced two years prior to the establishment of a fish commission in Maryland, strengthen our hopes and confidence in the result of our efforts. More important to us still than the accumulated evidences of the laws which govern the migrations of the salmon are the proofs which have been added during the year that these laws are as surely applicable to the migrations of the shad.” We cannot spare space to quote further from the very full and interesting report of Major Ferguson, and can only say that the hatching-house at Druid Hill Park is working very successfully on salmon and trout, while outside the commissioners are devoting their chief attention to shad and smelts, with every prospect of success, which another year will manifest in all probability.

Commissioner Moseley, of Virginia, says: "In the fall of 1876, our limited means being devoted to trout and land-locked salmon, we turned over the State's quota of California eggs to the Maryland commission. In return, that commission hatched and deposited, of young salmon, during the winter of 1876-'77, in the Shenandoah, 78,400; in Occoquan, 16,000; and in Goose Creek, Loudoun, 32,000. Besides, a very large portion of the above hatch was deposited in other tributaries of the Potomac, in the fish of which stream the people of this State have a common interest. It is no longer deemed a problem that this salmon will flourish in our waters and return by instinct to the stream in which it spent its infancy. Several have been caught in the Delaware and Susquehanna Rivers, the first streams in which they were placed, weighing from ten to fifteen pounds. In May last a fish weighing four pounds was caught in James River, at Bosher's Dam, nine miles above Richmond. The fisherman, never having seen such a fish before, brought it to Manchester, where gentlemen familiar with the *Salmonidæ* recognized it as one of that family. No doubt it was a California grilse, one of the lot put in James River in 1874-'75, at Lynchburg, by Dr. Robertson, which had straggled back before its time. It is probable that more of them may make their appearance next spring. Of the large number of these fish placed in James River by the commission, in the winter of 1875-'76, we hear that early in April last several were caught, from nine to ten inches long, twelve miles above Norfolk. They were said to be moving in solid column and with great rapidity oceanward, and only the few that fell out of line were captured in fyke-nets." (New Hampshire Report 1878, pp. 27, 28, 29.)

#### MISSISSIPPI VALLEY.

*Shad.*—The report of Kentucky has not yet come to hand, but the report of Iowa states that "shad were caught at several places on the Ohio River, the most notable case being at Louisville, Ky., where the catch during the run was reported at from forty to one hundred per day." This was in May and June, 1877, and a letter from Prof. Spencer F. Baird, United States Commissioner, to Forest and Stream, vouches for the fact that "a specimen sent him was the genuine white shad." Other letters to Forest and Stream state that 600 genuine Atlantic shad were caught at Louisville during the season, and trace them to the young fry planted, in behalf of the United States Fish Commission, by Seth Green in 1872, viz: 30,000 in the Alleghany River, at Salamanca, N. Y., and 25,000 in the Mississippi River, near Saint Paul; and 200,000 planted by the United States Commissioner in July, 1872, also at Salamanca. "In 1873, 100,000 shad-fry were placed in Greenbrier and New Rivers, in Virginia, and about 55,000 in the Monongahela, in Pennsylvania, and the Wabash, in Indiana; and these may or may not have contributed toward the supply met with at Louisville. The latter is pos-

sible, if the assumption of a four years' period is correct. If five years are required, then we must look to the stock of 200,000 in 1872 exclusively." (New Hampshire Fish Commission Report, 1878, p. 33.)

#### CALIFORNIA.

"*Shad*, in their season, are becoming quite numerous in the Sacramento River. The experiment of their importation to this coast has resulted satisfactorily. The river is of proper temperature, and furnishes an abundance of food for the young fish before they go to the ocean. There can be no doubt that the first shad brought from the Hudson River in 1871 have been to the ocean, returned and spawned. No shad were placed in this river during the years 1874 and 1875; yet shad two years old were quite numerous this year, and they must have been the product of the first importation.

"It may be safely asserted that we now have shad born in the Sacramento. As it is illegal to take this fish prior to December of this year, probably there has been no systematic fishing for them, yet numbers have been accidentally caught in traps and nets; probably not less than 1,000 were thus taken during the winter and spring of 1877." (New Hampshire Fish Commissioner Report, 1878, p. 35.)

