

118.—NOTES UPON FISH AND THE FISHERIES.

[Extracted from the official correspondence and compiled by the editor.]

PURIFYING WATER IN GLASS VESSELS AND AQUARIUMS.—To purify water in glass vessels and aquariums it is recommended to add to every 100 grams of water 4 drops of a solution of 1 gram of salicylic acid in 300 grams of water. It is said that thereby the water may be kept fresh for three months without being renewed. [From the *Norsk Fiskeritidende*, Bergen, Norway, October, 1886.]

CARP IN THE OHIO RIVER.—Mr. Hugo Mulertt, writing from Cincinnati, Ohio, on December 11, 1886, says: "This morning I noticed for the first time German carp in our public market. They were scale carp, and were caught in the Ohio River, some specimens weighing as much as 11½ pounds. They readily sold at nine cents a pound. The fishermen inform me that of late they have frequently taken German carp in the Ohio."

CARP IN ILLINOIS.—Fish Commissioner S. P. Bartlett recently sent to his colleague, Mr. N. K. Fairbank, a carp weighing over 15 pounds, which was taken with another of about the same size (each being a little over 30 inches in length) in the Illinois River. No carp have been placed in that stream by the commissioners, and these fish probably escaped from a private pond when young and grew up in the river. This one could not have been over five years old, as none were distributed prior to 1881. Mr. Fairbank had the fish baked at the Chicago Club, and invited half a dozen epicures to the feast. Though not so firm or flaky as the whitefish the flavor was good, and those who partook of it pronounced it an excellent edible fish. There are about 6,000 private carp ponds in the State, and the fish are becoming very popular, farmers raising thousands of them with little or no trouble. Both old and young carp are frequently taken from the Mississippi River near Quincy, Ill., being the results of several accidental stockings of this river and its tributaries. [From the Chicago Tribune, November 28, 1886.]

RECIPT FOR COOKING CARP.—Mr. N. T. Haverfield, writing from Cadiz, Ohio, January 29, 1887, gives the following receipt for cooking and serving carp, which has been used and much liked by him:

Take a four or five pound fish, clean well, split open down the back, leaving the head on; salt down in water for two or three hours; then take out, wash clean, and put in earthen vessel or crock, with vinegar enough (not too strong) to cover; and spice to suit taste, over night. Bake the next day and then set it away to cool. Serve cold with other meats cut out in slices. It is very nice for lunch.

VITALITY OF CARP.—A small lot of carp was sent to C. E. Jones, Carysbrook, Va., leaving Washington on the night of November 29, 1886, at 10 p. m. These carp were on the way over five days, they having been delayed in Columbia. Mr. Jones, who lives 12 miles from that point, on the Rivanna River, depended on the captain of a boat running between those points to bring the carp. The captain failed for several days to do so, and the carp lay over in the express room without a change of water. After this delay they were brought up the river in an open boat 12 miles with the thermometer at 23° Fahrenheit. When Mr. Jones opened the bucket, December 4, he thought the fish were all dead, as there were no signs of life and only a pint of water, the rest having been turned to ice; but noticing a slight movement of the gills, he transferred the fish to tepid water and in thirty minutes they were all lively. He then kept them over Sunday in the house, during which time none died or showed any injurious effects. This display of vitality is doubtless due to the cold weather at the time the fish were shipped and during their stay in Columbia.

LIABILITY OF YOUNG CARP TO STARVE.—Mr. O. P. Anderson, of Osceola, Iowa, writing November 9, 1886, says that during the past summer his thirty-two spawning fish produced millions of eggs which hatched well, but the young perished in less than three days after hatching. He wrote to inquire the cause of this. His letter was referred to Dr. Hessel, superintendent of the carp ponds, who, in reply thereto, made the following statement:

I do not think that Mr. Anderson's young fish died on account of any injurious ingredients in the soil or water. Probably the lack of natural food in the ponds killed them. Last summer was a cool one, the mean temperature of the month of May being 64° at the Washington carp ponds. The low temperature prevented the development of all kinds of infusoria, which are the natural and best food for young fish.

What Mr. Anderson might have done was to feed his small fish with uncooked brain from any kind of mammal. It should be mashed through a sieve to make it fine. A quarter of a pound per day is sufficient for 100,000 young fish when from two to six days old. When they get older, raw liver may be given in the same manner, one-half to three-fourths of a pound per day. The feeding should occur in the forenoon about 8 or 9 o'clock, and not in the afternoon or evening.

Common flour is also very good food for small fish, taking one-fourth pound of flour to three gallons of water, and boiling it to make a very thin paste. This, like any other kind of food for little fishes, must be given in the very smallest particles. Blood contains a large percentage of albumen, but must not be given to very young fry. The feeding grounds should be arranged by fastening pieces of old boards on the ground in shallow water so that they will be a few inches under the surface of the water. Fresh boards will not answer for this purpose.

WATER-BUGS SUPPOSED TO INJURE CARP.—Mr. J. P. Quarles, of Farmington, Wash., writing on December 29, 1886, says, in substance:

When draining my carp pond, in November last, I found a few carp whose tail fins seemed to have been nipped off, the places being covered with a fungous growth resembling a bunch of cotton, while one or two had one eye gone, and in its place was the same fungous growth. In the water there are many bugs of three kinds: (1) This is about $1\frac{1}{4}$ inches long by three-fourths inch wide, with a spare head like a beetle's, and with long black wings, which are hard. (2) This has a round body, with a head something like that of No. 1. (3) This is smaller, being about three-fourths inch long by one-half wide, and very numerous. It seems black in the water, but when out of water is black-and-white spotted. It floats around the edges, but when alarmed dives to the bottom. In the air it flies rapidly. When pressed with the hand it either bites or stings, which is very painful. I think these bugs are what injure the fish, but would like some information.

CARP MULLETS CULTIVATED IN NORTH CAROLINA.—Mr. W. R. Fraley, of Salisbury, N. C., writing on December 14, 1886, speaks of carp mullets,* which he has cultivated with considerable success, substantially as follows:

For several years I cultivated carp mullets in one of my ponds with good success. These fish bred well, and were the only fish, in fact, that would do well in my ponds. On receiving my first lot of carp I dispensed with the mullets for a time, but after a few years resumed their cultivation. Though they were placed in a separate pond, a freshet carried some of the carp into this pond, and I allowed the two kinds of fish to remain together.

This seems to have been very disastrous for the mullets; for though they increased for a while, yet last March, when I put in a net to catch some, I found them in very poor condition. In November, 1886, I drained the pond, and found only four little mullets, very poor and very small, while there were about 250 fine fat carp of three different sizes. Under these circumstances I have come to the conclusion that the carp, being a very greedy fish, kept the mullets away from food and worried them to death; and I believe, in general, that if carp mullets, or any of the sucker tribe, are put in a pond with carp, the latter will eventually starve out and destroy the former species.

Some years ago I had millions of these mullets in my pond. They grow to weigh $1\frac{1}{2}$ to 2 pounds, and are an excellent table fish if taken in the fall or spring, but become insipid and soft in warm weather. They are the only fish I ever succeeded in raising in my ponds except

* This fish, scientifically known as *Moxostoma carpio* (Val.) Jordan, is mentioned in Jordan & Gilber's Synopsis of North American Fishes, page 139; while the quarto History of Aquatic Animals, page 614, speaks of several species of red horse (*Moxostoma*) or suckers, of which this seems to be one, as somewhat common in the West and South; and the carp mullet is figured by name at Plate 222 B of this quarto.

the carp. My stock was procured from a mill-pond situated near Sandy Creek, in Davidson County, North Carolina.

DISEASE AFFECTING SPECKLED CATFISH.—Mr. B. B. White, writing from Thomaston, Ga., June 30, 1886, says that about a year ago he stocked a pond, previously occupied by carp, with speckled catfish; but that in the fall of 1885 they began dying. The old fish weighed from 2 pounds down, and they produced thousands of little ones about last September; but now all are gone except a few, and none of these are healthy. The pond is artificial, dug in a black muck swamp, and is fed by a constant spring of good drinking water.

SPECKLED CATFISH IN NORTH CAROLINA.—Mr. O. C. Anthony, writing from Centre, Guilford County, N. C., January 15, 1887, says that he has two ponds for fish-culture, one for carp, the other (which is about 100 by 40 feet and 4 feet deep) being devoted entirely to speckled catfish. In this last pond, in March, 1886, he put 10 speckled catfish obtained from Mr. J. F. Jones, of Hogansville, Ga.* They spawned in August, producing many hundred fry; and when he last saw them, before cold weather set in, these young fish were from 1½ to 2 inches long. Mr. Anthony expresses the opinion that the cultivation of specked catfish will be more profitable than carp culture.

SHAD ON STATEN ISLAND IN 1842.—“On the south side of the island, preparation is made in March for the shad fishery, which continues in April and May. This fish, when properly cooked, is one of the most exquisite and savory of the finny tribe. It is a migratory fish, and visits the northern streams annually, to deposit its eggs in the fresh water beyond the reach of the tides and voracious fish of the ocean. It formerly ascended the Hudson River above Stillwater, and spawned in Saratoga Lake, but the obstructions in its outlet at the mouth of Fish Creek have long since excluded them from that lake.

“After the shad has spawned, it becomes poor and thin, and so much altered as hardly to be known for the same fish. The old fishes which have not been taken in ascending our rivers, return with their young, and pursue their way coastwise until they reach the Gulf of Mexico. Every spring, shad frequent the Delaware, the Hudson, the Passaic, and Connecticut Rivers. They grow fatter as they gain more northern latitudes. At Charleston, S. C., in February, they are not esteemed. When they reach Philadelphia, in March, they are in good condition and fine eating. In April and May, they are still better in New York, and those taken in Connecticut River are esteemed the best.

“The shad is the *Clupea alosa* of scientific writers. (See Mitchell's New York Fishes.) On Staten Island the seine or draw-net is sometimes employed in taking shad, but the fike, or stationary hoop-net, is principally used to capture them. Along the southern and eastern shore of the island, every person who has a farm fronting on the water

* For an article on the speckled catfish, by Mr. Jones, see F. C. Bulletin for 1884, p. 321.

where the shad run, has his fike or fikes prepared in due season, and set at a proper distance from the shore. The fike is lifted at every low tide and the fish taken out. If the proprietor take more than is required for his own consumption, the surplus is sent to the New York market. Occasionally, in some situations, the fishery is more productive than the farm. But in the memory of the writer, the run of shad has very much diminished." [From Transactions of the New York State Agricultural Society, &c., for the year 1842, Vol. II, p. 194.]

MACKEREL OFF CAPE FEAR.—The United States Hydrographic Office, in a letter to Professor Baird, of February 12, 1887, said:

"The following report was received to-day from the Branch Hydrographic Office at Philadelphia. Schooner S. M. Bird, February 2, in latitude 33° 49' north, longitude 75° 50' west, saw many schools of mackerel, with large numbers of gannets and gulls over them. Three years ago the captain and mate of the schooner sighted mackerel in the same position."

SHAD IN THE SAINT JOHN'S RIVER, FLORIDA.—Dr. H. H. Cary, superintendent of the Georgia Fish Commission, writing to Professor Baird from La Grange, Ga., December 10, 1886, says:

The shad commence running in the Saint John's River the last of November, and fish from that point have been for sale in the Atlanta (Ga.) markets for the last ten days. The run of shad in the Saint John's last season was quite large, as was evinced by the rather poor appliances used in capturing them. It now seems that enough ripe fish can be taken to warrant the establishment of a shad hatchery on this river, which could be made the distributing point for the extreme Southern States.

SHAD HATCHING AND DISTRIBUTION IN CONNECTICUT IN 1886.—The report of the Connecticut fish commission for 1886 states that the shad-hatching operations at Birmingham, on the Housatonic River, conducted by Mr. Henry J. Fenton, were very successful. There were hatched and planted in the waters of the State 8,368,000 fry, at a cost of \$1,000, the young shad being distributed as follows:

Connecticut River	3,000,000
Housatonic River.....	2,568,000
Thames River	1,300,000
Quinepiac River	1,000,000
Farmington River, tributary to the Connecticut	500,000
Total.....	8,368,000

SIZE OF FISH EGGS AND NUMBER CONTAINED IN A QUART.—The following data give the basis for computing the number of fish eggs of various species contained in a given measure. The table was prepared by Mr. Wm. F. Page, of Central Station, and it is thought will be found convenient for reference. The difference in count is considered to be due mainly to a difference in the size of the eggs.

Species.	Diameter of egg.	Number of eggs per standard quart of 57.75 cubic inches.	Authority.	How calculated.
Spanish mackerel (<i>Scomberomorus maculatus</i>).	Inch. .040	*1,267,728	R. E. Earll.....	From diameter.
Codfish (<i>Gadus morrhua</i>).....	.055	335,000	H. C. Chester...	
Whitfish (<i>Coregonus clupeiformis</i>)..	.125	134,800	W. F. Page.....	By counting quart.
Shad (<i>Clupea sapidissima</i>).....	.123	128,239	do.....	Do.
Rock fish (<i>Isoetes lineatus</i>).....	.133	24,363	.....	From diameter.
Rainbow trout (<i>Salmo irideus</i>).....	.....	56,624	W. F. Page.....	By counting quart.
Brown trout, from Germany (<i>Salmo fario</i>)..	.....	8,301	E. M. Robinson ..	By counting 8 cubic inches.
Brook trout, domesticated (<i>Salvelinus fontinalis</i>)..	.....	||11,092	William Buller ..	By counting quart.
Lake trout (<i>Salvelinus namaycush</i>)..	.230	5,720	W. F. Page.....	Do.
California salmon (<i>Oncorhynchus chouicha</i>)..	.250	3,696	.....	From diameter.
Atlantic salmon (<i>Salmo salar</i>).....	.260	4,272	W. F. Page.....	By counting quart.
Landlocked salmon (<i>Salmo salar</i> var. <i>sebago</i>)..	.283	3,300	do.....	Do.

* F. C. Report for 1880, p. 405.

† The number derived from F. N. Clark's count of fraction of quart is 36,800; see F. C. Report for 1880, p. 575. In February, 1887, W. F. Page found 33,450 in a quart of eggs, from Northville, by actual count.

‡ W. P. Sauerhoff obtained the following in May, 1886, from counts of 1 gill: Large eggs, 22,752; ordinary eggs, 28,800.

§ Other counts: F. N. Clark, from count of 1 fluid ounce (F. C. Report, 1882, p. 820), 12,800; G. A. Seagle, from count of 4 cubic inches, 9,485; E. M. Robinson, from 2 counts of 8 cubic inches, 7,625 and 6,375; W. F. Page, February, 1887, from count of 1 pint of eggs, from Shasta, Cal., 6,530.

|| In February, 1887, W. F. Page counted 13 ounces of eggs, from Northville, yielding 13,098 to the quart.

PETITION TO RESTRICT FISHING IN MASSACHUSETTS.—The following petition was prepared late in the summer of 1886 for presentation to the next session of the Massachusetts legislature:

To the honorable the senate and house of representatives in general court assembled:

The undersigned respectfully represent that they are citizens of the Commonwealth of Massachusetts; that to us it appears that there is danger of the exhaustion of the food-fishes formerly so abundant in the waters upon our sea-coast; that we believe that one reason for the scarcity of such fishes is occasioned by the setting of stationery apparatus and the use of purse-nets and fykes, set and used in seasons which prevent their natural increase; that the scarcity now universally complained of is not occasioned by want of food, by the alleged impurity of the waters, nor by the depredations of one or more kinds of fishes upon others, but is due partly to overfishing and unseasonable fishing with the use of wholesale and improper apparatus.

That the time has come when, in order to preserve our fisheries, the general court should interfere by proper and timely legislation; that for a period of nearly forty years permission has been granted for setting and maintaining traps, pounds, and other apparatus, to the gradual but constant decrease of the fishes both in number and in size.

That the catching of fishes has been monopolized by a few, to the injury of the rights which belong to all, and to the probable exhaustion of the fisheries themselves; that it is but just that the experiment

should be fairly tried by the stopping, during certain seasons of the year, of the use of traps and all nets, to the end that it may be determined whether the fisheries may not be wholly or partially and gradually restored, and the public, on the whole, be better and more economically supplied; that in view of such costly scientific research as has been made, and such evidence as has been at the public expense collected, it is too late to say that the fishes have merely disappeared.

Wherefore, we pray that proper legislation may be had to prevent the setting of stationary apparatus for catching fish, and the use of nets and other movable devices, earlier than the first day of May in any year, with three open days after in each week, and for such other acts and laws as shall to justice and the well-being of the people in this regard appertain.

BILL AUTHORIZING INQUIRIES RESPECTING THE DESTRUCTION OF OYSTERS BY STAR-FISH, ETC.*—*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the Commissioner of Fish and Fisheries shall prosecute investigations and inquiries in respect to the destruction of oysters in the natural oyster-beds lying within the waters and jurisdiction of the United States, by star-fish, winkles, and other animals destructive to oyster life, and also whether any and what protective measures should be adopted in the premises, and shall report upon the same to the next Congress; and the sum of \$10,000, or so much thereof as may be necessary for such purpose, is hereby appropriated from any money in the Treasury of the United States not otherwise appropriated, in order to enable said Commissioner to make the investigation herein provided for.

FISH AND LOBSTERS IN RARITAN BAY.—Mr. Uriah Seely wrote, about February 15, 1886, from Great Beds light-house, near South Amboy, N. J., substantially as follows: During the past summer there was better fishing than for years past in Raritan Bay and along the shore. Weakfish, bluefish, and striped bass were abundant; and there was an unusual quantity of horsefeet or king-crabs. The bay was full of menhaden most of the season, probably because the fish-oil companies have not fished for them here for two years by reason of the oyster-stakes tearing the nets.

Lobsters reappeared here again last season after an absence of about twelve years. I discovered them late in October, and caught about 100 before the cold weather set in, after which I could not catch any.

On January 20, 1886, a few days after the ice had left the bay, just before sundown, I saw a large black object, about 10 to 15 feet long, out near the channel. While looking at it, suddenly it surged up bodily and then settled out of sight and did not again appear; and I now suppose it was a small whale.

* This bill (H. R. 10436) was introduced in the House of Representatives by Mr. E. W. Seymour, of Connecticut, on January 10, 1887, and was read twice, referred to the Committee on Commerce, and ordered to be printed. On February 5, that committee reported the bill, with an amendment changing the appropriation to \$5,000.

FISH TRANSPORTED FROM DUCK ISLAND TO DETROIT.—The following statement was furnished by Mr. C. W. Gauthier, a wholesale fish-dealer of Detroit, and was transmitted in a letter from H. C. Christiancy, special deputy collector of customs, Detroit, Mich., dated October 23, 1886:

Fish transported by the steamer E. K. Roberts, from the Canadian fisheries at Duck Island in Lake Huron, to Detroit, Mich., from May, 1885, to and including August 30, 1886.

Kind.	1885.		1886.	
	Quantity.	Value.	Quantity.	Value.
	<i>Pounds.</i>		<i>Pounds.</i>	
Whitefish	266, 169	\$7, 985 07	176, 149	\$5, 285 00
Trout	723, 707	21, 711 21	364, 143	10, 924 00
Pickeral	168, 805	5, 064 15	101, 569	3, 047 00
Sturgeon	183, 304	5, 499 12	30, 120	903 00
Frozen fish: Whitefish, trout, and sturgeon	186, 720	5, 601 60	.....	.....
Fish eggs .....	.....	.....	5, 300	205 00
Total	1, 528, 705	45, 861 15	677, 301	20, 424 00

GOLD MEDAL TO PROFESSOR BAIRD.—On April 30, 1886, the U. S. Department of State transmitted to Prof. Spencer F. Baird a letter of thanks and a gold medal which had been unanimously awarded to him by the departmental commission of fish-culture of the Lower Seine, France, on November 20, 1885, in acknowledgment of the supply of rainbow trout eggs (*Salmo irideus*) which resulted in the acclimatization of this species in the department of the Lower Seine. In his reply to the president of the commission, Professor Baird said that he would transfer the medal to the U. S. Fish Commission, as the service was rendered in behalf of that branch of the Government and not by him as an individual.

FISH-CULTURE IN SCOTLAND.—A circular from the Howietoun Fishery, Stirling, records the successful exportation of 200,000 salmon eggs to New Zealand and 100,000 Loch Leven trout eggs to Newfoundland last season. The landlocked salmon from Maine have thrived and will spawn next spring. The rainbow trout have not grown so rapidly as the Loch Leven. The prices of eggs per thousand are: Loch Leven, \$5; brown trout, \$5; American brook trout (*fontinalis*), \$7.50. The prices for fry are just double these figures.

SARDINE FISHERIES IN FRANCE.—The boats used in fishing for sardines are about 20 feet in length. They are square at the stern and sharp and high forward, thus sailing more easily but being a little more liable to upset. The nets are not weighted with lead, and are about 65 to 100 feet long by about 20 to 25 feet wide, made of fine thread, and meshed so that the sardines run their heads through and are caught by the gills. The upper portion of the net is floated by corks, which keep it in a vertical position. The bait, which is exported from Norway, consists of codfish eggs which have been preserved in brine.

There are certain birds which, by flying above the shoals of fish, indicate to the fishermen where these shoals are to be found. When a shoal is discovered, the sails are lowered, the nets arranged and cast into the sea, the bait is scattered, and the sardines are speedily captured.

The fish are prepared for market as soon as possible. Women cut off the heads of the sardines, clean the fish, and place them one by one on slabs of stone or marble, on which salt has been scattered.

While this is being done, fires are lighted and large kettles are filled with olive oil of superior quality. When it begins to boil, the sardines are placed in layers in iron-wire baskets provided with handles. These baskets and their contents are then plunged into the boiling oil, after which they are put on shelves to drain, from which they are taken to the drying place, where they are sorted according to size.

Sardines packed in tin boxes are the object of special care. After the fish are put in, the boxes are filled with fresh oil and hermetically sealed, which sealing is tested by plunging them for some seconds into boiling water. Those not perfectly closed leak at this test, and the work must be done over again.

This maritime industry in France during a good season occupies from 25,000 to 30,000 fishermen. During 1886, however, the season was very unfavorable, and the fishermen are in distress. [From the *Moniteur de la Pisciculture*, &c., 2d year, Series C, No. 24, Paris, France.]

TROUT AND CALIFORNIA SALMON IN AUSTRALIA.—The Melbourne Argus gives an interesting account of the successful conveyance and distribution of over 13,000 young fry of salmon-trout and brown trout reared from fish acclimatized at Sir Samuel Wilson's fish-hatching establishment at Ereildoune, Victoria. These fry were placed in 22 different streams and rivers with scarcely any loss, although carried great distances. From the same paper it appears that the California salmon introduced into Australian waters some years ago by Sir Samuel Wilson have been caught in various places up to 7 pounds weight.

SALMON FRY PLANTED IN NEW YORK WATERS.—Gen. R. U. Sherman, one of the fish commissioners of New York, writing from New Hartford, N. Y., on December 16, 1886, says:

"The fry of *Salmo salar* and *Salmo salar sebago* hatched last winter at the Cold Spring Harbor station and planted in the Saranac and St. Regis Rivers seem to have been a success, as numbers of the young fish 4 or 5 inches in length were seen in these waters last fall. These streams communicate with the St. Lawrence River, up which the *Salmo salar* have been accustomed to ascend and distribute themselves in the tributary streams from the first discovery of these waters.

SALMON FROM WASHINGTON TERRITORY AND SHAD FROM FLORIDA AND NORTH CAROLINA.—Mr. E. G. Blackford, writing from Fulton Market, New York City, on December 13, 1886, says:

"We are receiving in this market at present a number of salmon from Washington Territory, which are spawned male salmon and are of brilliant hues with horribly distorted heads.

“Shad made their appearance in market from Florida on the 3d of December. This morning one shad arrived from North Carolina, the first of the season.”

SALMON FISHERIES OF SOUTHERN OREGON IN 1886.—Mr. Zachary T. Siglin, deputy collector of customs, writing from the custom-house at Coos Bay, Oregon, on December 9, 1886, gives the following interesting facts and figures in regard to this customs district:

“The following is the product of the salmon fisheries of the Southern Oregon district for the year ending December 31, 1886 (the fishing season having closed November 30, 1886). The products of the different fishing stations in the district are as follows:

	Barrels.
Salted on Coos Bay	2,340
Salted on Coquille River	1,230
Salted on Siuslaw River	1,432
Salted on Chetco River	550
Salted on Rogue River	92
Salted on Umpqua River	60
Total salt salmon	5,704
5,704 barrels of salted fish, at \$10	\$57,040
Number of cases canned in district, 44,482, at \$4.50	200,169
Total value of fish	257,209

“Each barrel of fish contains 200 pounds, and each case contains 48 pounds, thus:

	Pounds.
5,704 barrels	1,140,800
44,482 cases	2,135,136
Total	3,275,936

“It is seen by the above report that the salmon fishing of this district is of considerable importance, being wholly confined to bays and rivers.

“The carrying of these fish to market is very irregular, as the vessels taking them are engaged in a regular and steady freighting business, carrying coal, lumber, agricultural products, merchandise, &c., the fish constituting but a minor portion of the cargoes. Whenever there is a quantity of barrels or cases ready for shipment, they are taken to market along with other freight. Thus it will be seen that the report of this class of fishing cannot well be made otherwise than as above.”

RESOLUTION TO INVESTIGATE THE OREGON SALMON FISHERY.—Mr. Herman submitted to the House of Representatives the following resolution, which, on December 20, 1886, was referred to the Committee on Commerce and ordered to be printed:

“Whereas, a leading industry in the State of Oregon is the salmon fishery, the value of the export shipments for 1884 being \$3,000,000, embracing 672,350 cases of canned salmon, while the same year the total wheat and flour export was valued at \$5,600,000; and so rapidly has

this industry grown in value to the State and nation that in capital employed in fisheries Oregon stands eighth in order among the States; in persons employed, fifth; and in value of fish products, the third in order; and

"Whereas, it is reported that the propagation, increase, and growth of said fish are greatly retarded by injuries received from imperfect and ill-devised fish-ladders, fishways, nets, seines, fish-traps, fish-wheels, and other devices, and often from poisonous matter deposited in the navigable streams of said State, and that great quantities of said fish not matured are caught, killed, molested, and injured by said wasteful methods of capture and unhealthy deposits, thereby depleting the great supply and seriously interfering with the proper maturing of the young fish: therefore,

"*Resolved*, That the United States Commissioner of Fish and Fisheries be, and he is hereby, directed to investigate the methods of fishing pursued in said State, and to ascertain those which are most injurious to the preservation of this industry, as well as to the regulations and stringent measures deemed necessary to prevent future waste and wanton destruction; also to inquire as to the authority and constitutional power of the Government to regulate and protect the fish and fishery interests on navigable waters of the nation, or on any waters forming the boundary between States or States and Territories, and to report to this House."

RESULTS OF PLANTING WHITEFISH FRY IN LAKE SUPERIOR.—Mr. W. David Tomlin, writing from Duluth, Minn., on December 31, 1886, says:

"The fishermen belonging to the Duluth Fishery Association have noticed large numbers of young whitefish in the Lake Superior entrance of Allouez Bay. Competent judges among the fishermen, who have seen the fry for many years, say there is no question about their being whitefish. Some of them think they can recognize a difference in the fish, and say that they resemble the Lake Erie whitefish. This is a positive indication that planting fry is resulting successfully, and will in a short time restore the fishing grounds of this famous lake."

CODFISH PLANTED IN CAPE COD BAY.—Capt. J. W. Collins, commanding the Fish Commission schooner *Grampus*, in a letter from Gloucester, Mass., January 28, 1887, states that the *Grampus* left Wood's Holl at 11.10 a. m., January 27, with 2,000,000 young codfish on board. The fry kept in excellent condition, with a temperature of 34° Fahr., and there seems to have been no mortality whatever. At 7.30 a. m. of the 28th they were planted in Cape Cod Bay, in 29 fathoms, Race Point bearing E., 3½ miles distant, temperature of air and water being 33½°. The plant was made successfully, it being young flood when the fish were put overboard, and the tide probably carried them from 3 to 5 miles farther up the bay.

A MAN KILLED BY A SWORDFISH.—Mr. W. A. Wilcox, writing from Gloucester, Mass., on August 12, 1886, tells of an unusual occurrence,

from which letter and a newspaper clipping of a few days later the following is taken:

Capt. Franklin D. Langsford, of Lanesville, Mass., while out in a dory in Ipswich Bay, struck a swordfish with a harpoon. The fish at once turned upon them, thrusting his sword through the dory and into Mr. Langsford several inches, striking him near the base of the spine. On August 12 the captain died from peritonitis. The fish that drove his sword through the boat weighed over 300 pounds, and the sword measured about 4 feet in length, half of it being broken off in the boat. This is the first accident of the kind which has resulted in the loss of life that is known to have been recorded here.*

MACKEREL, BLUEFISH, CODFISH, ETC., OFF NORTHEASTERN MASSACHUSETTS.—Mr. James W. Elliott, keeper of the Plum Island Life-Saving station, near Newburyport, Mass., in a letter dated April 19, 1886, gives the following note on the fisheries near that station:

“The first mackerel caught near Newburyport was taken June 10, 1885, and small catches were made for a few days; then no more were seen until June 25, when small schools were seen in the bay well off shore, a few being caught nearly every day up to August 23, when large schools made their appearance and many were caught by seines. They remained for a few days and then left for other grounds. At intervals of from a week to ten days they returned, and during all the time there were some caught within a radius of 15 miles of this place. The last school of any amount was here about September 30, when for a few days many were caught in sight of this station.

“The first bluefish was seen on August 9, 1885; but only two were caught in this vicinity. A number were caught about 7 miles south of this station until August 11, when they disappeared entirely. It was quite a large school, but they would not take the hook.

“Codfish have been caught between the Isle of Shoals and the station all the year, but none were taken within three miles of Plum Island until about March 10, 1886, when small quantities were caught at times. We set traps several times within 2 miles of the shore, and caught nothing, neither could we catch more than a very few on the ledges near the station. One whale was seen on April 17, 1886, blowing about a mile off shore, the only one seen from here since last October. Some few codfish and haddock were caught near the shore about April 15.”

SOME LOCALITIES WHERE CHICKEN HALIBUT ARE FOUND.—Capt. J. W. Collins, writing from Gloucester, Mass., January 7, 1887, refers to a letter from Professor Baird to Mr. W. A. Wilcox, in which it was stated that during October, 1886, there were shipped to New York 1,000 pounds of halibut that averaged 3 pounds each, which had been taken largely by vessels fishing on Cashe's, Jeffrey's, and New Ledge, on clean sand or rocky bottom. Captain Collins then continues:

* For a remarkably persistent attack of a swordfish upon a vessel, see Fish Commission Bulletin for 1886, page 143.

"The fishermen often find young halibut in considerable abundance on Cashe's, New Ledge, and Tippinies, the last fishing ground being most noted for their occurrence. When haddock fishing, about 15 years ago, we often caught chicken halibut in about 40 to 45 fathoms of water, ESE. from Chatham. On one occasion we took about 60 small halibut on a single set of our haddock trawls. Strangely however, a full-grown halibut is seldom caught in any of these localities; and it would be useless to look there for breeding fish. I have seen halibut, varying from 15 to 40 pounds in weight, very numerous on Grand Manan Bank, in shallow water where the tide runs hard."

DEAD FISH ALONG THE COAST OF SOUTH CAROLINA*.—Mr. W. St. J. Mazyck, writing from Waverly Mills, S. C., January 15, 1887, incloses a newspaper clipping, from which, together with his letter, the following is extracted:

For 30 miles along the upper coast of South Carolina, from Pawley's Island to Little River, the beach is so thickly covered with dead fish that the sand can scarcely be seen. These dead fish are of the kind known as menhaden, porgies, or fatbacks, most of them being about 5 inches long, and are valuable for fertilizing purposes. They were first observed, it is said, on December 29, 1886. The people along the coast, and for miles into the interior, are hauling the dead fish away and using them for manure. This same phenomenon is also reported at other neighboring points along the coast, and opinions differ as to what is its cause. Menhaden were noticed in Long Bay, off Pawley's Island, in June last, but were not observed again during the season.

In a letter of February 8, 1887, inclosing a communication on this subject from Mr. Taylor, Mr. Mazyck adds: "As far as I can learn, about 1,500 bushels of these fish have been hauled away for manure."

DEAD FISH ALONG THE COAST OF SOUTH CAROLINA.—Mr. J. Manigault Taylor, in a communication to Mr. W. St. J. Mazyck, from Waverly Mills, S. C., February 5, 1887, giving an account of his observations regarding dead fish thrown upon the shores of some islands on the coast of South Carolina, says:

"On December 24, 1886, I noticed a number of small menhaden floating dead in the creek that separates Pawley's Island from the mainland. This was rather surprising, as they are fish that disappear at the coming of cool weather. On the next day the number was largely increased, and the whole marsh for miles was gray with them, as the receding tide had left them in the forks of marsh stalks. That night the odor from dead fish on the beach became very unpleasant, and on the 26th, when I walked over to the beach, the sight was astonishing. The tide, which was nearly low water, left the beach 75 yards wide from high-water mark. This was completely covered, from 18 inches deep at the top down to an average of 6 inches deep; and the water was so thick with dead fish for at least 75 yards out that the surf could not

* For other notices in this Bulletin, of similar occurrences, see pages 140 and 174.

break at all. These were all menhaden from about 2 to 4 inches long, with now and then a big shrimp among them. I found that the whole beach of this island* was as described, as were the shores of Magnolia Island on the north and of Debardue Island on the south. Here, then, are 20 miles with this deposit 150 yards wide from 6 to 18 inches deep, and I am informed that it extends as far north as Little River, 36 miles from here. The most tenable theory to account for this, that I know, is that some eruption has taken place at the bottom of the ocean somewhere south of us, throwing into the water sulphurous or other noxious gases, and the southerly winds that prevailed for three weeks previous brought the dead fish to this coast."

ESTABLISHMENTS FOR UTILIZING FISH PRODUCTS.—One of the most remarkable of recent developments in the way of making the most and best of the fishing industry is the establishment of the Normal Company, which is now setting up factories at various parts of the coast of Great Britain. In an article describing the enterprise, the Edinburgh Scotsman says: The production of cheap and nutritious food is the principal object of the company, whose factory at Aberdeen, Scotland, in interest and extent, surpasses the famous fish-refuse and oil-making factories of the United States. The work includes the manufacture of fish extracts, for which there is a large demand both at home and especially on the continent, of glue, gelatine, and manure, from fish refuse, and the preserving of fish in a body by new and improved methods. Fish of all kinds are used, and transformed into extracts, soups, sausages of various kinds, glue, cement, gelatine, albumen, oils for medicinal and other purposes, leather, guano, and bone-meal. The processes of manufacture are a triumph of scientific skill. The methods of preparation, which are secured by patent, were invented by Mr. C. A. Sahlström, as were also many of the machines employed in the manufacture. One extract of meat produced by the company is made exclusively from the flesh of whales and allied marine animals. It takes time to overcome prejudice, but in reality the flesh of the whale resembles that of reindeer, and it is entirely free from smell or any oily flavor. The meat of a large blue whale of 200 tons yields, in round numbers, 5,000 pounds of extract, and every pound of extract gives about 100 pints of soup. Other soups are made in variety to suit the palate of the most fastidious. As an example of what is achieved in turning the so-called "offal" to account, it need only be mentioned that the flesh of the cod, ling, and other kinds of fish can be used dried or for extract, glue, and guano; the bladder for isinglass; the backbone for glue and bone-meal; the head for extract, glue, and guano; the roe for albumen; the liver for oil, extract, and fibrine; and the entrails for glue and guano. The external coverings of the larger kinds can be profitably removed and tanned. They give a strong and good skin,

* Pawley's Island: Mr. Taylor was the only person living on the island during the winter.

very suitable for portfolios and book-binding. Raw materials now considered as almost worthless are thus utilized to great advantage by the company. The Aberdeen factory covers an area of 39,200 square feet, and includes a dining-room and restaurant (opened a few days ago), as well as a drying chamber and drying machine, where the largest fish may be dried in from 12 to 20 hours, giving a far better result than if dried in the open air. Large factories are also in course of erection at Barra (an island of the Hebrides) and Thorshavn (capital of the Färöe Islands), each of which will employ 150 men all the year round. It is proposed to establish restaurants in various populous places, where dinners of two dishes, mostly produced from fish, can be had for two-pence. [From the Fish Trades Gazette, London, England, February 5, 1887.]

FISH CONVEYED INLAND BY RAILWAYS IN GREAT BRITAIN.—The total quantity of fish conveyed inland by railways in the three countries of Great Britain during the past six years are summarized in tons as follows:

Country.	1880.	1881.	1882.	1883.	1884.	1885.
England	194,561	203,778	205,939	215,480	254,088	242,257
Scotland	50,944	49,259	56,874	66,117	63,738	78,858
Ireland	7,447	7,279	6,372	8,565	7,688	8,909
Total	252,952	260,316	269,185	290,171	331,414	324,424

On the north and east coasts of England in 1885 more than 1,000 tons of fish were sent from 12 places, Grimsby taking the lead with 66,790 tons. Nine ports on the south coast of England send over 1,000 tons by rail; while on the west coast five ports send a similar amount. Thirteen railway companies carry this total amount of fish inland, six of which are carrying less fish in 1885 than they did in 1880, which may be the effect of the railway rates. The Scotch ports sending inland 1,000 tons or more of fish in 1885 are 22 in number, Aberdeen leading the list with 6,708; while in Ireland there is only one port that exceeds 1,000 tons, Kinsale in 1885 sending 1,603 tons. [From the Journal of the National Fish Culture Association, London, England, January 15, 1887.]

SHAD IN CALIFORNIA.—Mr. R. H. Buckingham, president of the California fish commission, writing from Sacramento in January, 1887, states that shad are taken in that State during every month of the year, while but a few years ago none were to be found; and it is thought that the first was taken in April, 1879, in a gill-net, the weight of the fish being five pounds. Now the whole California coast is well stocked with shad. There is no State hatchery for this species here, but at the spawning season great numbers of the breeding fish get into the swampy lakes near Sacramento, where thousands of the young hatch and remain there landlocked until the rise of water in autumn, when they find their way to the river and thus go to the sea.

Monthly summary of the fresh fish, oysters, &c., inspected by the Health Officer of the District of Columbia during the year 1886.

Kinds.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Black bass, big-mouth <i>a</i> *	600	1,800								2,800	2,800		8,000
Carp		17		2	22					3	15		59
Catfish*	8,565	8,295	34,350	47,145	22,380	29,740	26,010	21,575	15,955	26,130	18,725	6,070	264,940
Clams				73,800	411,000	595,000	527,000	466,000	302,000	14,000			2,388,800
Crabs				14,000	125,500	152,100	184,400	149,300	65,800	900			692,000
Croakers*								2,925	1,175				4,100
Drumfish					3			2	33				51
Eels*	85	305	1,415	9,375	5,610	2,160	2,060	1,795	1,785	3,125	4,125	370	32,300
Flounders*									270	2,685	845		3,800
Herring			331,814	4,390,005	2,247,250	38,624							7,007,723
Hogfish <i>b</i> *								190					190
Mud shad <i>c</i> *			4,005							740	4,475	1,260	27,055
Mullet, fresh-water*	8,185	8,390	5,500	3,965	120			335	115	3,185	4,910		25,035
Oysters	3,615	2,590	34,610	20,250	3,135	1,055	630	870	13,600	41,400	63,300	49,600	281,100
Pike*	2,940	3,190	19,695	2,945	90	595	2,405	1,650	380	2,895	7,035		46,840
Scup <i>d</i>													583
Shad			6,544	133,733	38,526	2,274							181,077
Sharks							1						1
Sheepshead					110	437	141	58	161	63			970
Spanish mackerel						1,149	2,061	2,141	424	247			6,922
Spots <i>e</i> *						1,050	4,415	21,785	6,840	4,715			38,805
Striped bass <i>f</i> *	6,135	2,065	43,580	23,550	6,935	15,425	26,150	35,690	34,455	85,335	126,775	35,515	441,610
Sturgeon				11	432	698	147		163		4		1,621
Tailor shad <i>g</i>				5,707	122								5,829
Tailors, salt-water <i>h</i> *					4,200	32,000	25,875	56,680	41,975	11,705			172,435
Turtles, green <i>i</i>					4	15	2	1	1				23
Weakfish <i>j</i> *				675	31,700	20,100	10,555	21,735	17,785	48,455	465		151,470
White perch*	490	4,070	24,050	23,500	8,500	11,815	14,790	10,065	9,165	14,685	37,155	9,315	167,600
Yellow perch*	5,990	5,280	23,570	8,380	990	2,615	1,445	775	810	4,980	6,475	2,510	64,150

* Reported in bunches, but here reduced to pounds on the basis of 5 pounds to the bunch.
a Or North Carolina chubs.
b Or grunts or pigfish.

c Or winter shad.
d Or porgies.
e Or goodies.
f Or rockfish.

g Or hickory shad or fresh-water tailors.
h Or bluefish.
i Or sea turtles.
j Or gray trout or squeteague.