V.—REPORTS OF STATE COMMISSIONS IN REGARD TO REGULATING THE SEA-FISHERIES BY LAW.

REPORT OF COMMITTEE OF RHODE ISLAND LEGISLATURE, MADE AT NEWPORT JUNE 15, 1870.

The committee,* at the first of its several meetings, (which have taken place at Providence, Tiverton, Seconnet, Newport, and Narragansett Pier,) chose Francis Brinley, of Newport, chairman. They found it necessary to obtain the services of a secretary who should aid them in recording the testimony of witnesses examined by them, and J. Talbot Pitman, esq., of Providence, consented to act in that capacity. The duties have been performed by him with accuracy and to the great satisfaction of the committee.

The process of oral examination was so exceedingly slow and tedious that the committee were soon convinced of the impracticability of continuing it if their labors were to terminate in season to report at the May session, and a series of eighty-two interrogatories was prepared, with printed instructions, (copies of which are annexed,) and widely distributed. The chairman has received prompt, sworn answers from many persons. As was anticipated, the statements are somewhat contradictory, and in some particulars utterly irreconcilable. These numerous documents have been carefully examined and considered by the committee with an anxious desire to get at the truth. It should always be borne in mind that the fisheries have, from the time of the charter of Charles II down to this present time, been considered deserving of recognition and special regard. The right of fishing belonged to each individual, and he could not and ought not to use it so as to infringe upon or destroy the right of another. Now, it is the alleged violation of this individual right, and of a common but sound principle of law as well as of morals, by the introduction of trap-fishing, that the people on the inland waters of the State complain.

The oral and written testimony laid before the committee, establishes the fact that whereas scup were formerly abundant in the waters of Narragansett Bay, and constituted a cheap and nutritious article of food to the inhabitants, readily found and easily caught, they have gradually left these waters, until they are quite abandoned by this species of fish, and partially so by other species.

To what cause shall this change be ascribed? The opinion is very generally expressed by witnesses, that it is owing to the interception of fish by the various traps and nets which are scattered in their way, so that some of the deponents entertain a belief that they will soon be utterly exterminated.

In this connection let us advert to the deposition of Mr. C. H. Bassett,

* The first part of the report is omitted as consisting of general considerations on the subject in the way of statistics, &c.

of Barrington, a very intelligent man. In answer to interrogatory 38, he says, "I have caught scup both side of Stone Bridge. These fish spawn in this bay; the fish caught in Kickamuit River had never been out of that river; they were spawned there, and if not disturbed would have returned there the next spring, as sure as the bird comes back to its old haunt." In answer to question 58, he adds, "My opinion is, these fish follow along the coast and would fill all the bays and rivers, where no obstruction was placed; as a drove of cattle going along the road will come into your fields if the bars are down, so these fish in their migration would fill our bay were it not for the traps." A portion of his answer to question 80 is, "For a fortnight past I have fished nearly every morning for two or three hours on Barrington Bridge, and have conversed with a great many carpenters, shoemakers, and other workmen who come to the bridge to catch a few tautog, if possible, for a dinner before going to their day's work; they say formerly they were able (when scup and fish were plenty) to come down here and catch all the fish they wanted before they went to their day's work. They all tell one story. Before traps were allowed, there were plenty of fish; could catch enough in half an hour. One very intelligent man thought it made one hundred dollars difference in the cost of living to those persons living on the shore and in the small towns on the bay, and, from my own experience, I have no doubt there are a thousand persons living near the shore to to whom it would make this difference, amounting to a loss to them amounting to one hundred thousand dollars each year, the loss in the high price of fish in Providence market not being taken into account."

It was in evidence that such vast amounts of scup were sent to New York, Philadelphia, &c., that the increased catch did not reduce the price for home consumption. Mr. Bassett, in his answer to the 50th question, states that "in former years Providence market was almost wholly supplied with fish from the bay. The bay and river was a vast reservoir from which we took out fresh fish from day to day, as we wished. I remember seeing a fisherman salting down a car-load of bluefish, because all he could get offered was one and a half cents per pound. A fish he was then glad to sell for twenty cents would to-day sell for $1 25. Under the hook-and-line system, we had scup from five to six months in the year at a very low price; now we get scuppaug for about fourteen days, and stale at that; when the fish were allowed to come in the bay, we had them near the city, and they came to our market 'live and kicking.' Under the present destructive system of trapping, not only is all our summer supply sent off, but the fish not being allowed to spawn, the natural increase is cut off." According to the testimony of Daniel L. Church, of Portsmouth, "up to noon of this 16th day of May, 1870, between nine and ten thousand barrels of scup, and about three hundred barrels of other fish, including fifty barrels of striped mackerel, have been caught between Brenton's Reef and here, (Seconnet,) and about two-thirds of this whole catch have been caught at Seconnet Point."

The scarcity of fish in the bay has by some witnesses been attributed to the impurity of the water arising from deleterious water poured into the bay from Taunton, Fall, and Providence Rivers, and other sources, where the residue of chemicals, &c., is permitted to mingle with the pure waters of the ocean. On this point, as on others, the evidence is very inconclusive and contradictory. In certain localities doubtless the waters are impure; but the pollution does not extend so far by any means as some persons in all honesty contend.

Mr. Bassett, in his answer to interrogatory 57, says, "As to the im-

purity of the water, Barrington River was always famous scup-ground; Kickamuit River the same. I cannot find a person who knows of any impurities in those waters that were not there fifty years ago; but no scup are now caught there to-day, and with the tide ebbing and flowing twice every day, the impurities falling into the bay are hardly more noticeable than a drop of ink into a hogshead of water."

Scarcity of food has been assigned as a reason why fish are not so numerous in the bay and rivers as heretofore. Again opinions differ, some persons believing there is no want of food, and others affirming its scarcity. In the opinion of your committee, the preponderance of evidence is that there is an abundant supply.

Mr. Bassett, in reply to question 57, says, "My opinion as to scarcity of food is, that there is the same amount as formerly; some have said muscles are scarce; on this point I can say, in the spring of 1868 I lived at the head of Bullock's Cove, and two or three mornings of the week went on to the muscle-bed off Nayatt or Bullock's Points, carrying a pair of rakes, and always pulled up all the muscles we wanted; they were so plentiful on Bullock's Point that a man in my employ, at a very low tide, shoveled into a sea-weed scow as many as two horses could draw, and put them into the manure heap."

In answer to the 80th interrogatory, Mr. Bassett says, "This trapping has destroyed a business which formerly was followed by many of our citizens. I do not know a man in the city of Providence who now follows fishing for a living, and for this reason: I think fish are so scarce in the bay they could not make a living. Boat-building was formerly carried on here by six or seven different concerns. I know of but two now, who build a few boats. All the business formerly connected with down the river boating-parties has been broken up, and our citizens go down to Maine or other places for fishing."

This witness presents the view which, in general, is that of the hook-and-line fishermen. In juxtaposition, the committee propose to place the evidence of Benjamin Tallman, of Portsmouth, well known as a fisherman of very great experience, and who may be considered as the inventor of trap-fishing. His examination by the committee was thorough and protracted. His oral reply to the 5th printed interrogatory was as follows: "The proportion of tautog to scup is very small. I don't suppose that the average of each trap would amount to four hundred pounds the whole season. In 1867, in nine days, I got $18,000; I have six traps; had three traps on one line; employed twenty-seven men on these three traps and twenty-seven on the other three; couldn't tell how many barrels; sold them at about $2 per barrel; should think about 10,000 barrels; got one morning $3,000 before breakfast. In 1868 did nothing. I had nine gangs, and expected to have got $30,000, but did not get over $6,000. The reason was it was owing to the northeast winds; cold storm all the time; kept the fish off the shore in deeper waters. In 1869 had six traps and six gangs; took about $6,000. Horse-mackerel came along about the 25th of May; the price averaged $2 per barrel; some sold for $1 and some for $3."

As to the number of traps, he stated, "There are nine setting-places, eight for double gangs and one for single gang, at Seconnet Point; there are three set further south than usual this year. There are seventeen gangs, of about ten men each, including the cook. At the Flints, on Sachuest Point, there are six gangs, having fifty-six men, between Sachuest Point and Easton's Point. Three at Gooseberry Island; one belongs at Newport, one at Tiverton, and one at Portsmouth. East of Brenton's Reef, single gang. Two traps at the Wash-Bowl, west of

Brenton's Reef; one owned at Newport and one at Portsmouth. There used to be *one* at Castle Hill—whether now there or not I cannot tell—small one. On west side of Conanicut, north of Beavertail, there is a trap owned by Gladding, as I understand; took three hundred pounds of menhaden yesterday there. Sometimes a trap is set this side and north of Point Judith, in pleasant weather; but not much is done with it."

That an approximate estimate may be made as to the cost of these traps and necessary apparatus, the committee refer to the following statements of Mr. Tallman. In answer to the 8th printed interrogatory he stated that "it takes about four hundred and fifty pounds of twine to make a trap, for the trap part alone; that's the average for an average-sized trap. The leader about two hundred fathoms long; that's the average of the leader at Seconnet Point; weight about six hundred pounds. We have a purse-seine used a year and then made into a leader. Twine costs now about $1 per pound; some is over that; most of the twine costs $1 15 down to 85 cents; worth about half-price when used as a leader. As a general thing, we use new twine for the trap and pound. Cables cost about $6 apiece; use ten for a trap; ten anchors to a trap, costing $15 each, and worth that. Cables would last two years good. Think the best way is to have a new cable; cable after being used one year would be worth $2. Three little boats (14 feet long) to each gang, and worth $65 apiece, new; they will last about six years; depends upon where you use them, somewhat. Two large boats (30 feet keel) to carry fish to vessel, to a gang. Boats worth $1,400 each will last ten years; could be used for other purposes. There are two boats (19 feet keel) to a gang, which are used to carry out the anchor-warps, set the traps, &c., cost about $165 each; these boats are also used for menhaden-fishing. New twine put into traps and taken good care of, would be good for another year."

To the 11th and 12th printed interrogatories, he answers that "there is a law among the trappers at Seconnet Point that no leader shall be more than two hundred fathoms; the leaders come out in a line ten fathoms beyond the one above it. At the Flints, the leader is five hundred fathoms from the beach, but the one on the Point is seventy-five fathoms. On the five hundred fathom leader three traps are set; on the one at the Point only one trap is set. The trap is about twenty-eight fathoms wide, so that a trap set in seven fathoms of water would be about fourteen fathoms across; the length is about thirty-four fathoms."

In regard to the diminished number of fish, Mr. Tallman testifies, in reply to printed interrogatories 23 and 24, that "sea-bass are not so plenty as fifteen years ago; then they were worth three cents per pound, and the same now. Tautog same price as fifteen years ago, three cents per pound. With the exception of scup, prices are the same. Scup are three times the price they were then. The first thing we did forty-five years ago, if we saw scup, we used to pull up the nets when fishing for menhaden and let them go, for fear they would cut the seine to pieces. Ten years after, we sold them at ten cents per barrel, for manure. Ten years after, we began to send fish to New York, packed in ice, and they were then sold for twenty-five cents per barrel. Not more than two vessel engaged in the business. Most of them used for manure were sold at about sixteen cents per barrel. About twenty years ago you could buy as many as you wanted for sixteen cents. About twelve years ago the price would average for shipping fish, fifty cents per barrel. Not more than one-fifth was used for food. Those sold for manure brought about twenty cents per barrel. No scup have been sold and used for manure for about eight years, to my knowledge. The price

then would average about one dollar per barrel, I should think. The price has been constantly and gradually increasing ever since; the average price last year was about two dollars a barrel; they have brought $4 50 per barrel. The price has been increased in consequence of increased demand and scarcity of fish, together with the facility of carrying them to market. I have seen seventy vessels taking in fish and waiting their turn, twelve loading at one time, at Seconnet Point." To the 25th interrogatory, he says, "I should think that about three thousand barrels of scup were carried to Providence. I should say not over one-fifth of the takings were used in the State for food, for the last three years." "Scup," he says, in answer to interrogatory 31, "were caught above Stone Bridge in 1825 and afterward. In the year 1823, or thereabouts, they were caught at Church's Cove. That is about the first seining that was done about Seconnet Point. From 1825 to 1845 any quantity of scup were caught; after that they did not so many come up the river as formerly."

Mr. Tallman is of opinion that if these methods of taking fish were disused, the market would not be better or fish more plenty, because the fish the trappers take would not have stopped in the bay; all the impurities of the waters at Fall River, Providence, &c., deleteriously affect the fish.

These two deponents may be said to fairly represent the opinions and convictions of the hook-and-line men on the one hand and of the trappists on the other. It will not escape observation that they agree on two important points: *first*, that there has been a gradual diminution of the number of fish entering the bay or river; *secondly*, that fish are not as cheap as formerly. They differ as to the cause of the decrease, but it must be admitted as a fact that contemporaneous with the introduction of traps was a decrease of fish. In this connection we may use the language of Professor Greene in his speech before the general assembly last winter: "Is it not an accepted principle of philosophical investigation that where two facts follow each other in this close order of sequence, they bear to each other the relation of cause and effect? Does the severest logic demand any other test than that the cause should be adequate, the effect evident? Is it not to reasoning like this that we are indebted for all that we know of the laws of animal and vegetable life? What is theory but the generalization of phenomena, and what do we require of these phenomena but that they should bear the most rigorous investigation? That investigation, in questions like this, is experiment. If the theory be just, the experiments will confirm it. If the theory be false, the experiments will reveal the falsehoods. And here," he continued, "I might rest my argument, for all that we ask is, that this question, so important to every citizen of Rhode Island, should be brought to the test of experiment."

This report had reached this point, when the chairman received a copy of the Yarmouth Register of May 27, in which there is a speech made by Mr. Atwood, of the Massachusetts senate, on the 19th of April last, in relation to the petitions for the prohibition of net and seine fishing on the coast of that State. Mr. Atwood was opposed to any prohibitory legislation, because he had not any apprehension that the fisheries could be exhausted; that fish were migratory, or rather not permanently local; they sometimes have a locality, and, after the lapse of years, reappear; that therefore the disappearance of fish of any kind is not proof of their exhaustion, but merely of absence. Mr. Atwood states, "The scup that has been so abundant for many years south of Cape Cod extends to Florida, and is caught in great numbers along the coast. It finds a ready sale in New York, and other markets, but in

Boston market it is not known as a marketable species, and is seldom seen there. Only a few straggling specimens venture into the colder waters north of Cape Cod. Witnesses stated before the committee that they had a tradition informing them that scup first appeared in Buzzard's Bay in 1793." If it be true that scup will avoid the colder water north of Cape Cod, the force of the argument that if they are not taken at Seconnet Point they will keep on eastward, and then be taken by the fishermen of Massachusetts, is essentially impaired.

It must not be overlooked that Mr. Atwood in his speech has in mind the fisheries of the coast of Massachusetts, and not of Rhode Island; besides, he was relieved from constitutional scruple, inasmuch as there is no constitutional provision in Massachusetts as in this State in reference to the right of fishing, the intent and design of which he could not disregard. It may be, therefore, that he is warranted in his belief that in Massachusetts there is no necessity for the passage of any general legislative act for the protection and regulation of the sea fish and fisheries; but it does not follow that there is no necessity for such action in Rhode Island. Finally, he makes this admission: "If fish have diminished in any of the small arms of the sea, I should have no objection to the passage of a local act, provided it did not interfere with the rights of others."

Now, as the testimony is ample and conclusive that scup and other bottom fish have diminished in the rivers and bay and arms of the sea of Rhode Island since the introduction of trap-fishing, it appears to the committee that some legislative restraint, as to the use of new instrumentalities for fishing, which impair or destroy individual rights, should be provided and enforced. The grave and complex question, how to adjust that restraint, has been most anxiously and carefully considered by the committee.

The boats, anchors, traps, and other apparatus required for the prosecution of trap-fishing are of heavy cost; some or all of these articles and materials could be used for various useful purposes, if trapping was prohibited. But this great interest should not be stricken down at once. Care must be taken, however, that in seeking for the reasonable preservation of that interest, the claims of another and large portion of the people should not be disregarded. Mechanics and other respectable persons who, by a cast of the hook and line, could, without interfering with their regular duties and employments, add a dish to their frugal tables, have not now the same chance as heretofore. It was in evidence that in certain localities boat-building was quite abandoned; that parties did not visit Narragansett Pier, Stone Bridge, and other watering places, or soon left them, because the attraction of good fishing was wanting; and that this was attended by the depreciation of real and other property.

After a careful and anxious investigation of the subject, the committee have come to the unanimous conclusion to recommend that the use of all traps and heart-seines, and other contrivances for catching fish, not including pike-nets, shore or purse seines, be prohibited in all the waters of Rhode Island northerly of a line drawn from the southerly point of the rocks at Brenton's Reef, to the southerly point of Point Judith, and north of the Stone Bridge at Howland's Ferry.

FRANCIS BRINLEY,
JOSEPH OSBORN,
JOSEPH W. SWEET,
HENRY T. GRANT,
JABEZ W. MOWRY,
Committee.

NEWPORT, *June* 15, 1870.

The committee recommend the passage of the following act:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS.

January session, A. D. 1871.

AN ACT to prohibit trap and heart-seining of fish in the waters of Narragansett Bay.

It is enacted by the general assembly as follows:

SECTION 1. No trap, heart-seine, or other contrivance of any kind or description, other than pike-nets, purse-seines, shore-seines, scoop or hand-nets, and hook and line for catching fish, shall be set or drawn in any of the waters within the jurisdiction of the State, northerly of a line drawn from the southerly point of the rocks at Brenton's Reef, to the southernmost point of Point Judith, and north of the Stone Bridge at Howland's Ferry.

SEC. 2. That each and every person who shall be or shall have been engaged in setting or drawing any trap or other contrivance prohibited by the first section, shall be deemed guilty of a misdemeanor, and shall pay a fine of not less than fifty or more than three hundred dollars for the first offense, and for the second and every subsequent offense he shall be fined a sum of not less than five hundred nor more than one thousand dollars, and shall be imprisoned for not less than one month nor more than one year.

SEC. 3. That all and every the nets or other contrivances, apparatus, boats, and vessels of persons willfully and knowingly engaged or employed in violating the provisions of said first section, or in carrying off the fish so caught, shall be forfeited upon being condemned, as hereinafter provided, to and for the uses hereinafter provided.

SEC. 4. Complaint shall be made, or an information filed under oath or affirmation, by the mayor or city marshal of any city, the president of the town council, or any town sergeant, the sheriff and his deputies, and the city or town constables, whenever either of said officers has knowledge of the violation of the first section of this act within his jurisdiction, if no other complaint or information shall have been made or information filed against the same property for the same violation of said first section; and may make such complaint or file such information when the alleged violation has been committed in any place therein forbidden, and any such complaint or information shall set forth that the complainant or informant has reason to believe, or does believe, that the traps or other contrivances, apparatus, boats, and vessels, which shall be described as nearly as may be in such complaint or information, are being used, or have been used, engaged, or employed in violating the provisions of said first section, before any court of competent jurisdiction, and such proceedings shall be had therein as by law is prescribed for protection of personal property under the penal statutes.

SEC. 5. That any of the officers named in the fourth section may, without a warrant, seize and detain any traps and other property mentioned in the second section, found in use or engaged in violating the provisions, or which he has good reason to believe, and does believe, has been so used or employed, and shall convey the same to some proper place of security, and there to keep the same until said traps and other property mentioned in section second can be proceeded against as provided in the next preceding section; and upon said seizure the said complaint or information shall be made or filed within sixty hours after said property has been seized and secured as aforesaid; and when said information shall be filed in the office of the clerk of the court of common pleas within and for the county within which the said violation is alleged to

* This bill failed to become a law.—S. F. B.

be made, as provided in chapter 225, section 15, of the Revised Statutes, said clerk shall issue a warrant under his hand and the seal of said court, returnable at the term of said court to be held next after the expiration of twenty-one days from the time of filing said information, as provided in section sixteen of the last-mentioned chapter, and said clerk shall immediately issue notice of said information, as is provided in section seventeen of said chapter.

SEC. 6. Upon entry of judgment of forfeiture against said property so complained of or seized, the court, before whom the complaint or information shall be tried, shall enter up judgment that the same are forfeited to the State, which judgment shall be the judgment from which any appeal must be taken.

SEC. 7. Upon final judgment of forfeiture against such property, either in the original or appellate court, or upon forfeiture of claimant's recognizance to prosecute his appeal according to law, the court shall forthwith issue to the officer having such forfeited property in custody, or to some other proper officer, an order in writing directing him to sell the same at public auction, and pay the proceeds thereof into said court, and every such officer shall execute said orders and shall return the same with his doings thereon indorsed to said court within such time as said court shall direct.

SEC. 8. Whenever in such proceedings for forfeiture it shall appear to the court that there has been any irregularity in the service of any process issuing upon the complaint or information, or any omission to publish the notices required, or any defect or omission in the complaint or information or other proceedings, the court may permit the same to be amended, and direct such further service of process or publication of notice, as will, in the judgment of such court, be most effectual.

SEC. 9. No officer complaining or informing as aforesaid shall be required at the time of making such complaint to enter into recognizance, or in any way to become liable for the costs that may accrue thereon, or for any damages on account of such seizure, unless it be proved to the court that the complaint was made maliciously, and without good cause.

SEC. 10. All fines recovered, and proceeds of forfeiture made under this act, shall inure one-half to the State, to be applied for the purpose of protecting the fish in our waters, and the other half to the complainant.

SEC. 11. Any person convicted of any offense under the second section of this act may appeal from the sentence of the court to the appellate court then or next sitting: *Provided*, Such appeal be prayed for at the time of passing sentence.

SEC. 12. Upon such prayer of appeal, the appellant shall be required to give recognizance in the sum of hundred dollars, with good and sufficient sureties, in every case so appealed, with condition that he will file his reasons of appeal, together with a copy of the case, in the court appealed to, on or before the expiration of ten days after the date of said prayer, if sitting, if not, in the office of the clerk thereof, that he will appear before said court, and there prosecute his appeal with effect, and abide and perform the order or sentence of said court in said case, and that he will not, during the pendency of said appeal, violate the provisions of said second section, which said recognizance such court shall forthwith certify to said appellate court.

SEC. 13. Any person interfering with, obstructing, or resisting any officer in the performance of the duties herein prescribed, upon conviction, shall be punished as provided in the eighth section of chapter 211 of the Revised Statutes.

SEC. 14. This act shall take effect from and after its passage.

ON THE POSSIBLE EXHAUSTION OF SEA-FISHERIES.

BY THEODORE LYMAN, MASSACHUSETTS COMMISSIONER OF INLAND FISHERIES.

[From the sixth report of the commissioner, 1872.]

Turn now the inquiry from river fishes to those that inhabit salt water only; and take a representative. The scup belongs to Rimbaud's division of "white fishes," (*poisson blanc*,) that is to say, those which retreat in cold weather to the off-shore depths, and return with the warm weather to the shallow water close to the coast. Of this group no representative has been more abundant on the south shore of Cape Cod than the scup. Early in May they used to make their entry into all the bays and fiords in great multitudes. Their route is not so well made out as it should be, but, according to the best observations, they make their advance through the gap, about fifty miles wide, between Montauk Point on the west and Gay Head on the east. Where they come *from* is a more difficult question; for the species is plenty as far south as Georgia,* and nobody can say how far south the Vineyard Sound scup retire during the winter. It has been guessed that they go to the edge of the Gulf Stream; and this is as good as any other good guess. The same remarks apply to our shad, which come round Montauk Point, and thence, according to the fisherman's belief,† oblique westward to enter Connecticut River. It is the received opinion that the scup, as they near the shore, "fan out" to the northward and eastward, filling Narragansett and Buzzard's Bays and Vineyard Sound. J. N. Luce, a very intelligent observer, testified, at the legislative hearing of 1870, that scup appeared first at the *west* end of the Vineyard, and coasted its northern shore, passing into the tidal ponds in succession, beginning with Menemsha Bight, (see plate 1,) and continuing eastward. The big fish, some weighing two pounds, were in-shore, and the smaller ones out in deeper water. They appeared first at Gay Head between April 25 and May 10, and then were full of spawn, but, by the end of June, all the females were shotten; and in August, the tidal ponds were crowded with the young. The first frost was a signal for old and young to leave these ponds; the latter in such vast numbers that whole windrows of them were sometimes thrown back on shore by the surf. Of these big scup in the salt ponds, he had seen none since 1865, and he noted a diminution, beginning at the *east* end of the island, as soon as pounds were set in the neighborhood, whence he argued that in their passage eastward they got completely cut off before reaching the extremity.

The scup arrive near Newport from the 10th to the 12th of May; at this season they push their way slowly, sometimes making no more than four miles in a day. They then are said to be "numb," and are thought to be blind. The origin of these absurd notions is the fact that they are full of spawn, and are feeling their way cautiously, like most fishes in like circumstances; moreover, the temperature of the water variously affects their movements. When a cold northeaster blows, they hold more in deep water, to the great loss of the trappers. Their mode of entering Narragansett Bay was a subject of dispute. Some of the Saugkonnet trappers, whose interest it was to show that they took the scup *coming out* of the bay, maintained that the fish entered by the west pas-

* Holbrook, p. 175, pl. xxv, Fig. 1.
† Report for 1867, pp. 8, 12, 49.

sage, past Point Judith, passed round the north end or across the south end, and coming down the east passage, fell into the traps,* whose mouths were always set to the *north*. The hook-and-line men, however, averred that the scup pushed up both passages at once, and in the middle also, and those that were taken at Saugkonnet were hugging the shore and got set into the traps by the tide. Both views may be correct; but the second one doubtless is, because the singular inroad of young scup, which took place this year, and which will presently be spoken of, struck first at Saugkonnet and *afterward* at Beavertail. It is usually thought that no scup came in through Muskeget Channel, but this, like the rest of the theory, is not well proved. The first specimen was taken at Waquoit, this season, as early as April 25, and the greatest numbers taken were on May 10 and 13. The season was peculiarly early, and the first "run" near Newport was on May 3, which would be a week's difference between these points, not enough, perhaps, for the slow scup to move so far. The dates for appearance for past years, (table,) suggest that the fish of that part of the coast must strike in through Muskeget Channel.

Within a few seasons, a great change has come over the numbers and movements of the scup. In bays and salt ponds they have become nearly extinct; while in the great channels and near the mouths of the bays they still are found in considerable though diminished quantities. Witnesses disagree as to the exact time when scup began to fall off; indeed, it is not probable that they diminished uniformly and in all places at once. Some aver that a falling off was to be noticed only four or five years after the first traps were set, which would make the year 1850. But most of the testimony goes to show that it was between 1856 and 1866. Certainly in 1860 scup were still plenty at Point Gammon and in Lewis's Bay, near Hyannis. Four causes are alleged for this diminution: 1. Impurities in the water. 2. Want of food. 3. Traps. 4. Blue-fish. As to the first, although gravely put forward by certain witnesses, it is too absurd to be for a moment entertained. The idea of poisoning all the waters of Buzzard's and Narragansett Bays by a few mills and print-works near Providence, Greenwich, and Fall River, is ludicrous in itself; and it is moreover well known that live fish are found in plenty in close proximity to these very manufactories, and that live clams lie directly in the track of the drainage of petroleum works.† As to want of food, it was stated that the five-fingers (*Asterias*) had destroyed certain great muscle-beds, which were feeding grounds. But the dredgings of Professor Baird, during the present season, have shown, not only that there are vast muscle-beds still existing, but that the tautog were no more plenty there than elsewhere; and, moreover, the sea-water was everywhere full of the salpæ, fish-eggs, minute crustacea, jelly-fishes, and small worms which are usually found in such localities. The real perplexities of the question are to be found when the effects of traps and of blue-fish come to be considered. The traps can diminish scup in the way they have been diminished, only under certain conditions, to wit: (*a*,) all the scup must stand in between Montauk Point and Gay Head; because any that advanced through Muskeget Channel would nowhere find enough traps to interfere much

* A trap is a simplified weir. The bowl is merely an oblong, rectangular pen, of large size, and the fish would immediately escape, did not the fishermen, as soon as a school had entered, pull up the net bottom and shut them in. A trap, therefore, requires constantly to be watched. This modification of the *Madrague* is said to be the invention of Benjamin Tallman.

† See also Report of Massachusetts Commissioners for 1865, pp. 18 and 53.

with them between Waquoit and Monomoy Point, and therefore they would have continued abundant within these limits, while they would have grown scarce in Vineyard Sound and in the two great bays; (*b*,) all, or nearly all, the fish must, as they come in, crowd toward the shore at certain points, and must pass within 1,200 feet of it, because that is the usual length of the trap-leader; (*c*,) all, or nearly all, these scup must be captured before they have spawned, otherwise the race would be abundantly continued, despite the capture of the parents. Each of these conditions is fulfilled, according to the opponents of traps.

The scup, they say, *do* all stand in as indicated above; they are full of spawn; and they encounter a different pressure and a varying temperature, which render them slow and lethargic; and, in this condition, they are swept by tides and eddies against certain points of the shore, or of themselves seek the sunshine in protected nooks and bays, where they are captured by hundreds and thousands of barrels. If, on the contrary, they were let alone, they would soon cast their spawn and then would spread far and wide, as a bottom fish, greedily taking the hook. Under the present system, vast quantities of gravid fish are thrown on the market in May, but in the summer and early autumn it is hard to get any. The trappers admit the chief facts, though not the inference. They agree that the scup come in altogether between the Vineyard and Montauk Point; that they are "numb" and full of spawn at that time, and that during warm spells they stand close in, often seeking quiet coves; while, in cold, easterly weather, they keep off in deeper water. They admit, further, that the quantity taken is very great,* but maintain it is but a small proportion of the whole. They are lame in two ways; in the first place, they could give no reasons, that were tenable, for a diminution they fully admitted. In the second, they were usually very shy about giving any testimony at all before the Rhode Island committee. Nevertheless, it does not follow that they have the wrong of it. The question must be answered by a collection and a comparison of *facts*. It is clear that the scup approaches the shore in a way differing from that of the alewife, a hardy, active fish, which does not spawn till later, and then in fresh ponds. It *may* therefore be that scup will fall *en masse* into a trap, which alewives would under certain circumstances avoid, as has been nearly proved in the case of the Waquoit weir.

The blue-fish theory is an old one, but new in its application to scup. Mackerel and menhaden are, as is well known, driven away by them, but it has always been maintained that scup were too spiny to be a favorite food, and practically were let alone in favor of fatter and less bony prey. The witnesses in the Massachusetts and the Rhode Island investigation were unanimous in their assertion that a scup in the stomach of a blue-fish was a very rare thing; Professor Baird, however, has found many scup in their maw. It is true that these were usually from scup-traps, and the blue-fish may have attacked them simply because they were the only prey at hand. On the whole, it will be perhaps pretty near the truth to say that, although the blue-fish blindly destroys almost everything that comes in his way, his *main* food is the soft fishes and mollusks, such as menhaden, mackerel, alewives, and squid. Scup were abundant when the whites first visted the country, certainly from 1621 to 1642. At some time after this, not yet ascertained, they *disap-*

* In 1867, six traps at Saugkonnet Point took 10,000 barrels of scup. Next year, however, by reason of bad weather, they got only about a third as many for the whole season.—(B. Tallman.) In 1870, about 6,000 barrels of scup were taken by the Saugkonnet Point traps before May 16.—(D. Church.)

peared wholly, and, toward the end of the last century, were not known in our waters. About 1794 they reappeared, and became abundant. In 1864 they decreased very much, and are at present comparatively scarce. If now the blue-fish are the cause of scarcity, there ought to be some correspondence in their dates of appearance and of disappearance. They were plenty near Nantucket from 1659 to 1764, when they *suddenly* and totally disappeared, to reappear in 1830. Now it would seem that scup did not reappear till thirty years *after* the blue-fish went away, to wit, in 1794, and when the blue-fish came back in 1630, they found scup abundant, and lived side by side with them for thirty years, before the latter began decidedly to decrease. It is hardly in accordance with what is seen in nature, to suppose that a cause so active would take so long to act, or that, when it ceased to act, so long a time would be needed to restore the original state of things. And now, in the midst of this theorizing and seeking for evidence, rises a phenomenon which puzzles both parties to the dispute. About the 1st of June of this year (1871) those trappers at Saugkonnet Point, who had kept their netting down until that time, were astounded to find their traps clogged with myriads of "dollar-scup," little fish about the size of a Spanish dollar. They were tipped out of the bowls by hundreds of barrelsful. This swarm struck first at Saugkonnet, then at Beaver Tail; and thence apparently it slowly worked up the bay, so that in July these little scup were schooling round the wharves of Greenwich and Providence. In August they were still among the shallows, and were plentiful in the more eastern waters, at the extreme head of Buzzard's Bay, and in the neighborhood of Hyannis.

The weir-owner at Wood's Hole had had his nets established for seven seasons, but had never before witnessed this spectacle; and the same sort of evidence was given by other weir men. Benjamin Tallman, in his testimony, already cited, speaks of a large quantity of such little scup taken by a seine in 1864; and of another considerable batch brought up from deep water in a purse-seine, about 1855. It is to be observed that this invasion is nothing but an abundant "late run" of yearling fish, coming in its due season. The army of scup advancing to its spawning-grounds in May is preceded by a few skirmishers, and is in two or three divisions, of which the first is usually the most numerous, and contains the oldest fish; at an interval of perhaps two weeks there follows the second, and then the third, which is usually fewer in numbers and of smaller individuals. Sometimes, and in some places, the great and the smaller scup come mixed together, and the "runs" are not well defined. As with most schooling fishes, the young scup doubtless come last; and the phenomenon of this year's run had two peculiarities; first, it is more abundant by many hundred-fold than anything that has been seen since a dozen or fifteen years ago, when all the shallows, in midsummer, were full of these little yearlings; second, instead of following the deep channels at the mouth of the bay, the swarm struck directly to the coast on entering, and fell into the traps and weirs which chiefly are there set. This last is, to be sure, an hypothesis, but will be useful as a guide to future investigation. Mr. Luce, in his testimony, stated that the big scup coasted the shore of the Vineyard, while the smaller ones moved *outside*, in deeper water. In other words, the spawning fish sought their grounds, while those that spawned later, or that were too young to spawn at all, kept in the offing. The yearlings (assuming that they do not carry spawn) would come in and spread over the warm shallows simply to seek food; and this, also, the old fish do *after* they have cast their spawn; only they spread out in deeper water, where

they remain till the first frosts warn them to depart from the coast. Should such a view of their movements prove the correct one, the invasion of "dollar-scup" would simply be a normal movement of yearlings, which, owing to unusual warmth of water, or for some other reason, struck the first points of land on entering Narragansett Bay, instead of holding to the main central channels. The question would be narrowed down to accounting for their *vast numbers*, so sudden and so unwonted. The anti-trap men jumped to the conclusion that these little fishes were the progeny of *this* year's (1871) hatch; and accounted for the abundance by the very early appearance of the breeding-fish, which stood in by the last of April, whereas they usually do not appear till the 10th or the 12th of May. Consequently the trappers had not generally their lint on, and the first run, in good measure, escaped capture. But the "dollar-scup" were *last* year's (1870) hatch and not this year's, which, on the 1st of June, would not be larger than a squash-seed. The theory would properly account for an abundance of *this* year's hatch; and, as a fact, the little scup, two or three months old, might be seen in great numbers during August, feeding close to the shore. If, next year, (1872,) there should be a great run of two-year-olds, (hatch of 1870,) and if this run should spread over all the bays, and should be taken by hook and line during the entire season, as of yore, then it might fairly be laid down that the traps were *not* the cause, or not the chief cause, in the diminution of scup. In like manner it might then be said, though with less force, that the blue-fish were not a chief cause of the scarcity of scup; because, although blue-fish have notably diminished these last three or five years, and therefore scup might properly increase, yet the decrease in blue-fish has neither been so great nor so sudden as to warrant a *sudden* increase in scup, such as this would be. And, if neither traps nor blue-fish can be convicted, it will only remain to say that the diminution has been one of those changes in the numbers or the location of fishes, for which science can at present give no reason.

That there has been a change of location as well as a diminution is quite apparent; for whereas thousands of barrels are taken at Saugkonnet Point, along the south part of Aquidneck and at Beaver Tail, in the upper part of the bay they are nearly extinct. A change, too, there has been in their stay, for whereas the tautog grounds all over the bay were once so infested during the summer by scup that a hook could scarcely be got to the bottom, now they are on the shores during a part of May, and thereafter are seen no more. All this the anti-trap men explain very simply, by asserting that the big scup are practically annihilated each season by the traps, and that the supply is kept up only by the spawn which is shot in deep water before they strike the coast.

The same line of observation and reasoning that has been applied to scup, will, with little change, apply to tautog, rock-bass, striped bass, and other "white fishes" and "bottom fishes" whose decrease has been complained of. *Observations*, conducted through several seasons, by men of learning and impartiality, are the only means to real knowledge in this perplexed question. If the governments of the States of Rhode Island and Massachusetts have any forecast, they will see to it that such observations be made.

In this slight sketch, based, as it needs must be, on scanty and imperfect information, I have avoided dogmatic statements and rounded conclusions. I have tried to show the problem in all its crudeness, and to point out, both directly and by implication, the great gaps which must be filled before it can take on a scientific form.

FISHERIES ON THE COAST OF MASSACHUSETTS.

REMARKS OF MR. ATWOOD, OF THE CAPE DISTRICT, IN RELATION TO THE PETITION TO PROHIBIT NET AND SEINE FISHERIES.

SENATE CHAMBER, *April* 19, 1870.

The report (leave to withdraw) on the petition of T. D. Eliot and others, came up for acceptance by special assignment.

Mr. Hawes, of Bristol, arose and said that, as a large number of the petitions asking for a prohibitory fishery act came from his district, he was not ready to vote until he could have some further explanation.

Mr. Atwood, of the Cape district, chairman of the committee on the fisheries, arose and spoke at length, substantially as follows:

Mr. PRESIDENT: As so many petitions have been presented to this legislature and referred to your committee on the fisheries, asking for an act to prohibit certain modes of fishing now in use in the waters of this commonwealth, I feel it to be a duty incumbent upon me, as a representative of a district extensively engaged in this branch of industry, to occupy some time in giving somewhat in detail the reasons why your committee have unanimously reported leave to withdraw.

Early in this session, on the 12th of January, there was presented and referred to the committee on the fisheries, the petition of Charles W. Lovett, jr., and sixty-four others, claiming to be citizens and tax-payers of this commonwealth, asking for an act to prevent the taking of certain *salt-water* fish in weirs and pounds, and also that the taking of fish known as Spanish mackerel, and striped or sea-bass, in any seine or net, may be prohibited; but that the same may be taken between the first day of June and the first day of December, by hook and line only. On the following day the petition on T. D. Eliot and 1,225 others was presented and referred, and subsequently a large number of petitions in aid of the same, claiming that the practice of *pound-fishing*, *trap-fishing*, *drag-seining*, *purse-seining*, and *gill-netting*, is seriously and fatally prejudicial to the production and increase of fish. They pray that the legislature will, by suitable enactments, protect said fish and those of the community interested in their continuance and production, from these novel and improper modes of fishing. Also there has been presented and referred a large number of remonstrances against the passage of any general prohibitory act. For their number I refer senators to the printed report of the committee.

Though the two first petitions were not in aid of each other, still they were aiming to accomplish the same object, and they seemed to be inseparably connected; so much so that your committee deemed it expedient to hear the parties who would represent both at the same time. Accordingly all the parties were notified, and the hearing was commenced on the 15th of February. No less than 18 sessions of the committee were given to these hearings, during which time many witnesses testified, and very little was learned from the evidence that proved to the committee that fish were being exhausted. All agreed that the scup, tautog, sea-bass, and striped bass had within a few years diminished in Buzzard's Bay; but failed to show that over-fishing was the cause of the diminution. Like the many fishermen that I know, the witnesses were not well acquainted with the habits of fish. They study them no further than they contribute to their pecuniary interest. At most they possess only a local knowledge of the fish with which they come in contact. They prosecute the fisheries for their support, and do not make

the habits of fish a special study. Sir, if any other matter upon which there were more than 11,000 names on the petitions and remonstrances should come before the legislature, what would the committee expect? They would expect that experts and men acquainted with all the practical workings would come before them. An ordinary committee on the fisheries might expect men to come before them on a subject of so much importance as our *sea-fisheries*, that possessed a knowledge of the geographical distribution, migrations, habits, food, time of depositing their spawn, growth and development of their young, as far as it could be known, and, besides, all the changes that have taken place during a long series of years. That if certain species had diminished in Buzzard's Bay, from whatever cause, is there danger of the race being exterminated? The fishes that inhabit our waters, and in their migrations visit our coast, differ widely from those that were upon our fishing-grounds when I first engaged in the fisheries.

Mr. President, allow me to lay aside the evidence before the committee, while I briefly allude to the changes that I have noticed during a long life of practical experience in the fisheries.

I can go back to no earlier date than 1816, when I entered the fishing boat and followed fishing as a business for a period of *fifty-one* years, during which time there have been many changes. I shall speak of only a few species. The scup that has been so abundant for many years south of Cape Cod, extends to Florida, and is caught in great numbers along the coast. It finds a ready sale in New York and other markets, but in Boston market it is not known as a marketable species, and is seldom seen there. Only a few straggling specimens venture into the colder waters north of Cape Cod. Witnesses stated before the committee that they had a tradition informing them that scup first appeared in Buzzard's Bay in 1793. If so, I ask was it then that they first came into existence, or did they come from some other locality? I have been informed that in examining the old shell-heaps that have been deposited by the aborigines of this country many years ago, the bones of this species have been found, showing that they were here before this country was settled by Europeans. If they were here at that time, is it to be supposed that they were driven away by the Indians with their rude implements of fishing?

When I first engaged in the fisheries, and for many years after, there was a species of mackerel that annually visited our waters, known by the name of Spanish mackerel, that were abundant. It was not the species now called by that name. It was about two-thirds the size of a common mackerel, known to science by the name of *Scomber Dekayi*. (Excuse me for using classic names, I do it for the reason that there are so many local names for the same species, I fear that I may not be understood by any who may be acquainted with ichthyological science.) This species, although plentiful for many years, has long since disappeared, and I have not seen a single specimen for the last twenty years. They disappeared long before a weir, trap, or pound was used in our Massachusetts waters. The cause of their leaving us is unknown. We can assign no reason. There have also been great changes in our common mackerel. While in some years they come to us in great abundance, in other years they are comparatively scarce. In 1831, 385,559 barrels were packed and inspected in this State, after which there was a falling off in the catch, so much so that from 1839 to 1844 the number of barrels caught did not exceed 75,000 in any one year, for five years in succession. In 1841 the quantity caught was only 50,992 barrels. They have since increased. During the last ten years the catch has been, with the excep-

tion of two years, upward of 200,000 barrels annually. Last season it was 234,000 barrels. It will be seen that the catch of fish from year to year differs as widely as the product of our land.

About 1840 there appeared on our coast, south of Cape Cod, large quantities of shad, which appeared to be the same species with those that visit the Connecticut and Merrimack Rivers annually, (*Alosa prestabilis.*) Fishermen from Massachusetts, Connecticut, and Rhode Island engaged in this fishery, and found it profitable. In 1842 an act was passed by the legislature to prohibit fishermen from other States from fishing for shad within a line drawn from Monomoy Point to Point Gammon. I myself engaged in this fishery, but we found there was no need of the passage of such an act. The shad appeared in small numbers, so that not enough were caught to pay expenses. They were also caught in large quantities in the waters north of Cape Cod. They then disappeared, so that only a few straggling specimens have since been caught in these localities. Where were they before they appeared in our waters? What was the cause of their coming? Where are they now? All that can be said in answer, I can say in three words—they are gone.

Sir, I ask to be allowed to allude briefly to two species of fishes that are not caught by any mode of fishing that we are asked to prohibit. I do so for the reason that no less than four times petitions have been sent to the legislature asking for an act to prohibit fishing with trawl-lines (so called) in Massachusetts Bay. The report from the committee has always been "leave to withdraw." In 1858, when the report came up in the house of representatives, it was discussed at length, and it was there stated that if this mode of fishing was not prevented by legislative enactment, soon haddock would be as scarce as salmon. The report of the committee was accepted, and this mode of fishing has been in use since that time, and this species has been increasing from year to year, until they have increased in vast numbers, so much so that they are too plenty for the fisherman or dealer, and during the spawning season, which is the spring, they are sold at a low price—from two dollars down to fifty cents per 100 pounds. But it may be said the consumer pays a high price. I cannot help that; it is not that that I am discussing. I am trying to show the danger of exterminating the race of fish, if there is any, and do not intend to leave my subject, lest I may be called to order. When I first engaged in the fisheries, haddock was scarce on our coast, and in winter sold much higher than cod. They did not increase for many years after. They, however, became plentiful when the trawl-line was first used—about 1850—and every year they seem to be increasing. On the 4th of last March, when a large number of fishing-boats were out, the catch was larger than I ever knew before. The next day, 5th, there was brought to this city and sold at Commercial wharf, of cod and haddock, 621,953 pounds, as taken from the books of dealers that bought that day—a larger quantity than ever was sold of all kinds of fresh fish in a single day since Boston has been a city. What has been the cause of so great an increase? If I was asked how their numbers could be diminished, I have two ways now suggested to my mind: one is to introduce the beam-trawl, which has not been used in our waters, which is a large net-bag with a long beam across its open mouth, which is kept up some two feet from the bottom by an iron frame-work at each end of the beam, and as it is dragged along by the fishing-boat the fish pass into the net and are caught in the pockets at the sides as they attempt to pass out. This net being dragged over the bottom, would destroy the young fish as it passed over them, and might tend to diminish their numbers.

One other way would be to hire the fisherman to leave them, and to stand back and fold his arms and see nature perform her wonderful work without the interference of man. The present mode of fishing catches vast quantities of a species of flat-fish, (*Platessa dentata*,) which no doubt fed upon the spawn of haddock when the hand-line only was in use.

One other species, our common halibut, which is caught in the same way, have greatly diminished. When I first engaged in this fishery, Boston was supplied wholly with halibut caught between Cape Cod and Nantucket Shoals. The demand was limited—only a few could be sold. There were no railroads. Boston only wanted enough to supply the city and the surrounding towns. As facilities for transportation increased, and ice began to be used to keep them, they were sent further away. The supply would not meet the demand. The fishery was prosecuted by vessels from Gloucester, on George's Bank, and also on Brown's Bank, the western coast of Nova Scotia, and upon the Banks of Newfoundland, and voyages have been made to Greenland, and halibut have been caught in quantities as far north as the latitude of 68, on the western coast of Greenland. They seem to be decreasing on all the fishing-grounds. But I must pass them by, and leave senators to decide whether or not over-fishing has been the cause of the increase of the one and the diminution of the other of these two species.

It appeared in evidence before the committee that the fish known as the squeteague is increasing in the vicinity of Buzzard's Bay, and along the shore south of Cape Cod. Some sixty years since it was vastly abundant in the southern part of Massachusetts Bay, and although absent for so many years it seems to be returning to its former haunts.

But the great change that has taken place in our fisheries has been caused by the return of the blue-fish. This species was abundant on our coast many years ago. We are informed that in a journal of the first settlement of the island of Nantucket, written by Zacheus Macy, 1792, and contained in the Massachusetts Historical Collections, he says a great pestilence attacked the Indians of that island in 1763 and 1765, and that of the whole number, 358, 222 died. In that year, he says, the blue-fish disappeared, and I have no knowledge of a specimen being seen here for more than 70 years. We are informed that they are found in other localities. They are said to occur on the western coast of Africa, around the island of Madagascar, and also at Australia; if so, they are found over a wider geographical range than any other species with which I am acquainted, inhabiting the waters in both the torrid and temperate zones. After an absence of so many years, they returned, as appeared in evidence before the committee, about 1832, along the shores south of Cape Cod. They did not come north of the cape so as to affect our fisheries, until 1847, when they appeared in vast abundance, and drove away from our bay nearly all other species. I was at that time engaged in fishing for mackerel with nets. This was the last of our catch; and every year since, when our fishermen are engaged in this fishery, they appear. I have known them to appear as early as the second day of June, but usually they do not come until a few days later—from the 5th to the 15th. When they first appeared in our bay, I was living at Long Point, (Provincetown,) in a little village containing some 270 population, engaged in the net-fishery. The blue-fish affected our fishery so much that the people were obliged to leave the place. Family after family moved away, until every one left, leaving that locality, which is now a desolate, barren, and sandy waste.

These fish not only depopulated our bay of nearly all other species, but

they depopulated my village and my home. It was a matter of surprise to your committee that men professing to be acquainted with fish should come before them and say they did not know that blue-fish eat any other fish but menhaden; and as they are not an edible species, no matter how many they destroyed; and also say they did not know that they drove other species away. Call them, sir, by whatever name we please; whether blue-fish, of Massachusetts Bay; snapper, of New Bedford; horse-mackerel, on the shores of Rhode Island; or tailor, in Delaware and Chesapeake Bays, they are the same *Temnodon saltator* still, and deal out destruction and death to other species in all the localities they visit.

One other, a species of flat-fish, which is called dab or plaice at home, but when we bring it to Boston and offer it for sale we call it turbot. It is the *Platessa oblonga.* This species was exceedingly abundant along our shores before the blue-fish came. It is a bottom fish, and does not come so directly in contact with the blue-fish as top-water swimmers; still, it has almost wholly disappeared, owing to the blue-fish having destroyed its favorite bait, which is the common squid. It seems to be nearly exterminated in the waters north of Cape Cod, only a few being seen.

The striped bass have diminished in the vicinity of Cape Cod, as the blue-fish have destroyed the bait upon which they fed.

The so-called Spanish mackerel, (*Cybium maculatum,*) Cuvier says, is an inhabitant of the Carribean Sea, extending southward to the coast of Brazil. Dr. Holbrook mentions it, in his Fishes of South Carolina, as being found in the waters along that coast. It has wandered southward until it has reached the southern coast of Massachusetts, and even specimens have been taken north of Cape Cod. It sells in our market at a higher price than other species. It is, no doubt, an excellent fish, but it is probably not so much better than our common mackerel as the prices seem to indicate. It has been selling in Quincy market for a few summers past at from fifty cents to one dollar per pound. It has been increasing in our waters for a few years, and the prospect is it will continue to increase, until it will be a fishery of considerable importance. There is no danger of destroying them by catching them by any way we can, when it is only the few wanderers that come to us from the localities where they inhabit. I think they need no legislative protection to increase their numbers.

Such are a few of the many changes that have taken place since I first engaged in the fisheries. Time will not allow me to go into detail of the some one hundred and fifty species found along our New England coast. They may be said to form one great chain, each species being a separate link, having its own peculiar history and habitudes.

I pass now briefly to notice their fecundity. We look with wonder and astonishment at the provisions in the animal economy. How vast is the number of eggs produced by a single fish; hundreds of thousands, which, if any considerable percentage should come to maturity, the waters would be filled to overflowing.

Take a few thousand specimens, and allow ten per cent. to come to maturity; multiply them together for ten years, and how great would be the number! And what is that when compared with the countless myriads that swarm our coast annually? Their numbers, how vast! Human ingenuity has invented no means by which they can be enumerated; their numbers are only known to Him who created them, who feeds them with a bountiful hand, and watches over them with more than parental care.

Sir, if we study them with reference to their longevity, we see marks on them indicating age: the loss of fins; scars, where they have at some time received wounds that have permanently healed; marks of physical debility, which appear to be the result of advanced age. I regret to say that no Linnæus nor Cuvier, nor all the researches of science have ever been able to give us any indication by which we may know the age that fishes live with any degree of certainty. They pass off and on the coast as the seasons change during their natural lives, however long that may be.

In view of all the foregoing facts, where is the danger of exhausting our fishes? I fail to see the danger of exterminating them.

The British commission that was appointed in 1863 to investigate the fisheries of Great Britain and Ireland visited nearly all the principal fishing-places in the United Kingdom, and made a thorough investigation; asked and received answers to nearly sixty-two thousand questions. They came to the unanimous conclusion that there was no danger of exhausting the fisheries, either in the open sea or in any of the arms or estuaries along the coast, with all that man could do, and finally made their report to the British Parliament in 1866.

There were persons that did not wholly agree with the British commissioners. One of the most prominent is J. B. A. Rimbaud, who has published a work on the fishes of the southern coast of France. Himself a fisherman, he says that the migratory species, that go off to sea in schools and return each season, cannot be diminished by over-fishing, but local fishes can be exterminated by constantly fishing for them, and such has been the case in the locality where he had been accustomed to fish.

Of the two I allow Rimbaud to be the best qualified to judge, as he has acquired his knowledge by practical experience in the fisheries, and the British commissioners had gained their information from others. Sir, I hope I may not be charged with undervaluing scientific research; no man has a higher appreciation of the labors of scientific men than myself. Their kindness to me in aiding me in my investigations of fishes has laid me under the greatest obligations. I owe to them a debt that I can never repay.

Sir, I call attention of senators at this board to the locality where Rimbaud has gained his information—the southern coast of France. France on the Mediterranean is not like our own coast. There the land is high, and deep water near the shores. The area of fishing-grounds is comparatively limited. Our own coast is low, and shoal-water extends off a great distance from the shore. Besides that, the great chain of banks, commencing with Nantucket Shoals and running eastward a thousand miles, and terminating with the great Bank of Newfoundland, gives us an immense area of fishing-grounds.

On the coast of France there is not so great change of temperature in the water from summer to winter as on our own coast. The Gulf Stream comes out through the straits of Florida, running up the coast to Cape Hatteras, from whence it turns eastward. As it passes it leaves our New England out in the cold; its course is onward until it reaches the shores of Western Europe, making the water comparatively uniform through the season. I ask, are not the fish on the coast of France more permanently *local* than those on our own coast, where there are great changes of temperature from summer to winter? Tell me, sir, how many are there of our fishes that are not more or less migratory. Senators will see that our fishes and fisheries are not like those of Europe.

Mr. President, lest I may be misunderstood, I desire to define my

position. I firmly believe there is no necessity for the passage of any general legislative act for the protection and regulation of our sea fish and fisheries. If fish have diminished in any of the small arms of the sea, I should have no objection to the passage of a local act, provided it did not interfere with the rights of others; but I must confess that I am slow to believe that when fish have left a locality that any act on our statute-books will bring them back. If we wish to increase and stock our inland waters, it cannot be accomplished without protection. The building of dams across the streams, throwing of deleterious substances into the waters, have diminished the fish; but in the great sea man cannot pollute its waters by anything he can do. If this legislature should pass an act to prohibit those modes of fishing that have been called by the petitioners novel and improper, what would be the practical working? It would not only affect those directly engaged in them, but it would have also an indirect bearing. The large fleet of vessels belonging to Gloucester are a part of the season dependent on these fisheries for bait to be used in their bank-fisheries. The question was asked at the time of the hearing before the committee how the Cape Ann bank fishermen procured their bait before these modes of fishing came into use, but was not answered. When vessels from Gloucester first engaged in the halibut fishery on George's Bank they met there immense shoals of sea-herring, (*Clupea elongata.*) They could be taken in nets on the top of the water. After a few years they became less abundant, and were not seen schooling, but could be caught by sinking the nets several fathoms below the surface. Long since they have left that locality, and none have been caught there for several years.

Our mackerel fishermen require a large quantity of bait, to be used in the prosecution of this fishery, which is principally menhaden, caught in weirs or seines. Some 7,000 barrels of this fish was used by Provincetown vessels engaged in the mackerel fishery last season. Their whole catch of mackerel was about 25,000 barrels.

There is a large amount of capital invested in our fisheries, giving employment to a great number of men, who follow a life of hardship and exposure. They are a useful class of men, as they are producers. By their labors they bring to our tables a large amount of wholesome and nutritious food, which is a blessing to our people.

Sir, allow me one brief moment, while I allude to the life of a fisherman. He may enter the fishing-boat at nine years of age. Deprived of the advantages of school education, he follows his business from day to day. He may engage in some dangerous voyage. Follow him to the banks of Newfoundland, where he is not only exposed to gales and storms—he may in some seasons be surrounded by enormous icebergs, whose gigantic height and massive bulk adds to the danger. He is filled with fear lest his little bark may come in contact and sink beneath his feet. Beside this, the merchant-ship, on its passage to or from Europe, may, in some thick, dark, and stormy night, at one stroke put an end to his earthly voyage. What hardier occupation—what bolder daring can man display, than to lie down to rest shrouded in the gloomy solitude of a Newfoundland fog. As he leaves the cold, wet, and lonesome deck, at the end of his midnight watch, worn down by hardships and exposures, he lies down upon his bed, and while his cradle is rocked by the mountain billows, he courts that sleep that may know no waking. Day after day he looks forward with pleasing anticipation to the time when his voyage will end; when he will return; when he can rest from his toils, safe in the bosom of his home. Year after year, as his physical energies begin to relax, he dreads it more and more. He is still com-

pelled to work for his support and those that may be dependent upon him. Few fishermen get rich, while a great many of us remain poor. He may abandon his business, and stop on shore. With a few nets, or some other implements of fishery, he may be able to procure means to supply his wants.

The great question is, What is the danger of exhausting our fisheries if these modes of fishing are continued?

Nets have been used from time immemorial. We have an authentic history, that has come down to us, that tells us that more than 1,800 years ago, Jesus, walking by the sea of Gallilee, saw two brethren—Simon, called Peter, and Andrew, his brother—casting a net into the sea, for they were fishers, and he said unto them, Follow me, and I will make you fishers of men; and straightway they left their nets and they followed him. And going out from thence he saw other two brethren, James, the son of Zebedee, and John, his brother, in a ship, with Zebedee, their father, mending their nets; and he called them, and they immediately left the ship and their father, and followed him. This not only shows that nets were in use at that remote period, but that they also needed mending, plainly indicating that they were somewhat like our nets.

From the foregoing considerations that I have so briefly stated, your committee came unanimously to the conclusion that it was their duty to report that the petitioners have leave to withdraw.