

SECOND ANNUAL REPORT

OF THE

Commissioners of Fisheries

OF THE

STATE OF NEW JERSEY.

1872.

TRENTON, N. J.:
PRINTED AT THE STATE GAZETTE OFFICE.

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REPUBLICAN PARTY OF NEW YORK

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REPORT.

To His Excellency, Theodore F. Randolph, Governor of the State of New Jersey :

SIR:—The undersigned, Commissioners of Fisheries of the State of New Jersey, appointed by you under an act of the Legislature approved March 17, 1870, take pleasure in presenting to your Excellency their second annual report :

In their report for 1870, it was shown from reliable sources that our rivers formerly abounded with fishes both permanent and migratory. Such indeed was the case with all the rivers which drain the Atlantic slope, from the St. Lawrence to the Keys of Florida.

That the importance of the fisheries of these rivers was not lost sight of by our ancestors, is proved by the many wholesome laws enacted during the early colonial period ; more, however, with a view to regulating and guarding them, than to prevent exhaustion, for that seemed then almost impossible.

During the last half century, however, this delusion has been dispelled, and diminution and deterioration have progressed so rapidly as justly to excite the fear that this most valuable, nay necessary, article of food supply, from being within the reach of the poorest of our citizens may soon be classed with those luxuries attainable only by the rich.

So abundant and cheap were shad, herrings, and sturgeon, that it was formerly the custom of the people residing even remotely from the river Delaware to resort to the shore fisheries for their annual supply of fishes. At two large fisheries below Philadelphia, on the New Jersey side of the river, as many as from sixty to seventy wagons have often been supplied in a single day. So uncertain, however, has of late years been the catch, and so high the prices obtained, that these have given place to a few traders, who purchase usually some fifty shad, such herring as they can obtain and an occasional sturgeon, which are then hawked round the country. Occasionally a few visitors from the vicinity, attracted by the exciting scene of a large seine drawn to the shore by a numerous crew, visit the fisheries and purchase a few shad for their immediate use, instead of the one, two, or even three hundred formerly frequently purchased.

To Philadelphia are most of the shad taken, and like the

produce of most New Jersey truck farms, sold chiefly to dealers. By thus passing through several hands an exorbitant price must be paid by the consumer. Owing to their high price and scarcity no longer do the farm wagons from around Philadelphia visit the fish markets, and return as formerly laden with hundreds of shad. In the rivers east of the Hudson, the chief cause of diminution arose from the utilizing of the waters for mill and manufacturing purposes, by the erection of dams impassable by the anadromous fishes returning to their spawning grounds in the clear running waters above tide. In proportion as they have been cut off from these ranges, has depletion followed in every river. Another cause of their deterioration, more especially in rivers south of the Connecticut, has been excessive and indiscriminate fishing, while the immense amount of filth discharged by our city sewers and the noxious excreta from gas works, refineries, breweries and factories, not only assist in diminishing the numbers of fishes by destroying their spawning grounds, but frequently render unfit for food the few survivors.

Scarcity has naturally been followed by a corresponding rise in value, particularly after the breaking out of the late rebellion, when prices of all commodities reached an unprecedented height. The high prices of meats seem first to have drawn the attention of the people of Vermont and New Hampshire to the loss they had sustained in fish food by the erection of dams upon the Merrimac and Connecticut rivers, within the territorial limits of Massachusetts. An appeal was made by them to this State for the removal or mitigation of these obnoxious structures. This was promptly responded to by the appointment of commissioners of fisheries, whose duty it was to investigate the matter and suggest such measures as were, in their judgment, calculated to accomplish the desired end. The result of their labors has been that fishways, by which access is attainable by fishes to the spawning grounds from which they had previously been debarred, have been erected; by artificial incubation, the numbers have been greatly increased, and new and valuable fishes have been introduced. So general has been the interest thus awakened on this most important matter, that all the New England States, with New York, New Jersey, Pennsylvania and Virginia, and recently, by act of Congress, the United States have appointed fishery commissions.

In 1869 an act was passed by the Legislature of Pennsylvania requiring the commissioners of fisheries of that State to investigate the laws regulating the fisheries of the river Delaware, and to ascertain what additional legislative action might be necessary, especially in reference to concurrent jurisdiction with other States riparian to that river. In compliance with the provisions of this act, Col. James Worrall, commissioner of fisheries of the

State of Pennsylvania, visited Trenton and laid the matter before the Governor and the Legislature, then in session. Whereupon an act authorizing the Governor to appoint two commissioners of fisheries was promptly passed, and approved March 17, 1870. The joint commission of Pennsylvania and New Jersey at once entered upon their duties, visiting the tide water fisheries during the height of the shad fishing season, and the river above tide water in the autumn, to ascertain the effect of the obstructions at Scudder's Falls, New Hope and Bull's Island, upon the young shad in their descent to the sea, during the summer and fall. Full particulars of their visits and observations were given in their report for 1871.

Having thus thoroughly investigated the subject, the joint commission carefully prepared a bill which, in their judgment, fully fulfilled existing indications, and which, if enacted and properly enforced, would not only arrest the rapid depletion of the river still going on, but would, eventually and at no very remote period, restore to the stream, in a measure, its former repletion. This bill, after some modifications made to meet the views and in accordance with the desires of the different classes of fishermen, was first introduced into the New Jersey Legislature, and there passed by both houses without a dissenting vote. It received the immediate approval of your Excellency, and by you an attested copy of the act was transmitted to the Governor of Pennsylvania, with the request that it be laid before the Legislature of that State; as by the terms of the act, the assent of Pennsylvania was required before it could become a law. By the Governor it was at once transmitted to the Senate, by whom it was referred to the appropriate committee. This committee, notwithstanding the bill was the joint production of her own commissioner in the fulfillment of duties imposed upon him by a special act, and those of New Jersey, *failed to report upon it*, and this prevented action upon it by the Legislature of that State. Thus a measure of material interest to both States was frustrated. This failure was the more aggravating, as most of the provisions of the act might have been adopted independently by New Jersey, to wit, the appointment of water bailiffs, whose special duty should be the enforcement of the laws of the fishing code; the prohibition of the sale of unseasonable fish, that most powerful incentive to their illegal capture; and the collection of fines and enforcement of penalties against existing statutes.

Inasmuch, however, as the compact of 1783 gives to each State jurisdiction over the river from shore to shore, out of courtesy and to prevent conflicting enactments, it has been the uninterrupted usage of each state in all enactments regulating fishing in the river Delaware within their joint jurisdiction, to obtain the assent of the other before any act relative to that stream

should be put in force. Therefore, the action of New Jersey in this instance was not exceptional. But since Pennsylvania, on her part, has made it so by withholding her assent, it is hoped and your commissioners would strongly urge, that so much of the act as requires the assent of Pennsylvania be repealed or modified; that such part as is confined to the State polity of New Jersey, and does not conflict with the agreement with the adjacent State, may go into effect immediately.

The State of Delaware being also riparian to the river Delaware, it was deemed highly important by your commissioners that her fishing code should be in unison with that of Pennsylvania and New Jersey, more especially with the latter, since the centre or thread of the river constitutes, in a great measure, the boundary line between the States, and consequently the limit of jurisdiction, save only that portion of the river contained within a segment of a circle, the radius of which is a line of ten miles, measured from the court-house at New Castle, within which space Delaware claims exclusive control over the river. So important was concurrent legislation in this State deemed by your commissioners, that with the approval of your Excellency, and furnished by you with a letter of introduction to the Governor of Delaware, they, upon the 22d of February, 1871, visited Dover. By Governor Ponder they were most courteously received, and by him introduced to many of the members of the Legislature. A joint committee, consisting of members from both branches of the Legislature, was appointed to confer with your commissioners. Two conferences were held and the object of their visit explained. The result of this was the engrafting upon a bill then in course of preparation those provisions in the New Jersey act which were applicable to the State of Delaware, viz.:

Forbidding sale of shad out of season.

Also, the use of gilling seines of less than ten inches mesh between the 10th of June and the 10th of August. Thus not interfering with the sturgeon fisheries, in which a mesh of twelve inches is used.

Also, appointing as a close time, during which no fishing should be allowed, from sunset on Saturday until twelve o'clock Sunday night. [Vide Appendix, No. 1.]

In granting fishing licenses, Delaware discriminates between the citizens of her own and those of other States. The former paying \$5 and the latter \$20 to the clerk of the peace of any county within the State. From this source, and from the annual rent of the oyster beds (\$25 for every fifteen acres), a very handsome revenue is derived by the State.

To those conversant with the method of fishing with gilling or drift nets, the "thread of the river" will appear to be a very

indefinite boundary, calculated to involve the two States in conflict of jurisdiction, as these nets are stretched across the main channel of the river, and carried by each tide for several consecutive hours and over many miles of water, those used below Fort Delaware during the early part of the season averaging from four hundred to five hundred fathoms, while some are said to be nearly a mile in length. To meet the difficulties which might arise from this, occasion was taken to allude to the existing compact between Pennsylvania and New Jersey, whereby each State exercises jurisdiction from shore to shore, and the advantages which would accrue from a similar arrangement between the States of New Jersey and Delaware. This suggestion was favorably received, but the time fixed for the adjournment of the Legislature was so near at hand as to preclude any action during that session.

The shad and herring season of 1871, in both the Delaware and Raritan rivers was even less remunerative than that of 1870, certainly to the shore fisheries; and from the small amount of information afforded by the proprietors of the gilling seines, it would appear that those who obeyed the present laws and ceased at the end of the proper season were equally unsuccessful. Those, however, (and their number is legion) who, commencing about March 20, continued until July 20, a *period of four months*, were more successful, realizing doubtless a handsome profit.

The past spring opened unusually early, our rivers being free from ice during the month of March, and every indication was presented of an early fishing season. From the 10th of April, the date at which most shore fisheries commence operations, to the 1st of May, upon the Delaware, nearly twice the number of shad were taken than had been captured during the corresponding period of the previous season. About this time, however, an easterly storm set in followed by a freshet, which drove back the shad to the deep and salt waters of the bay, from whence they returned slowly and sparsely because of the many hundred intervening gilling nets. A remarkable feature in the history of the past fishing season has been that after the 10th of June, the period at which legal fishing in the tidal waters ceases, shad became more plenty and so continued through the greater part of July. An instance has come to our notice in which forty shad were captured in one drift on July 16, and another in which seventy-five were taken on the 18th of the same month. These instances show the great importance of the provision of the act passed during the last session of the Legislature, which extends the close time to August 10; for those fishing during the past season after July 10 were not violators of the *letter* of the law.

The law prohibiting all net fishing between sunset on Satur-

day and midnight on Sunday, has during the whole season been persistently violated in the tidal portion of the river, though above Trenton but few instances have been noticed. In the lower portion, however, to such an extent was the Sabbath desecrated, that from the aspect of the river no distinction could be drawn between the day of rest and the ordinary working week days. Such flagrant acts of lawlessness are not only injurious to the fishing interests, but are calculated in no small degree to lower the moral tone of the community. Leaving the religious element entirely out of the question, why should one class of citizens be suffered to pursue their avocations upon the Sabbath while all other classes are compelled, both by law and public sentiment, to suspend theirs? The appointment of fish wardens or water bailiffs, properly furnished with boats, as are the efficient harbor police of Philadelphia, and authorized by law to call in proper assistance when necessary, would tend much toward doing away with this as well as other infractions of the fishing code. Without boats the arrest and in many cases even the identification of the offenders would be simply impossible. The apathy hitherto manifested by the community toward these offenders against the laws of God and man, bodes no good.

The act of the last session of our Legislature, contemplated protection not only to migratory, but also to the common indigenous or introduced species, among which may be mentioned the cat fish and southern bass, the latter lately introduced into the river Delaware. Both these valuable fishes deposit their spawn in June and July; both guard their nests, the former even extending her maternal care over the young for some time, protecting them against the predatory attacks of their numerous enemies. Let but the parent fishes be captured during this period, and the young fall an easy prey. Again, the dragging of the net over the spawning ground cannot fail to produce evil effects upon the partially incubated spawn. It is well known that any disturbance will exert the most fatal influence over fish eggs, both in the earlier and later periods of incubation, and the effect of a heavy lead line sweeping before it gravel and small stones, cannot but be injurious. The provision of the act by which this was to be prevented, was the cause of our failure in securing concurrent legislation with Pennsylvania, a provision which would eventually have inured greatly to the interests of its opponents, the summer net fishermen.

From Kensington, Philadelphia, start some twenty-five boats, each boat containing four men and a net, the value of each boat and net being about four hundred dollars. From the time that shad fishing terminates until late in the autumn, these summer net fishermen make fishing for the cat fish a specialty. In the winter they fish the Chesapeake and Potomac. These fishermen

frankly admit that the cat fishes are rapidly decreasing in numbers. Is it asking of them too much, that the spawn be protected during the period of incubation, and the fry during that time in which they require the maternal cares of the parent fishes? By a trifling sacrifice of self interest, it must be apparent to every one that the numbers of these fishes might be indefinitely increased.

The southern or western bass (*grystes salmonides*) were introduced into the head waters of the Potomac river some fifteen years since, by a Mr. Shriver. They were transported from the Ohio in the tanks of a locomotive tender, through the kindness of the engineer, Mr. Stahler. They have multiplied rapidly, especially during the period of the rebellion, when fishing in the Potomac was generally suspended. By private enterprise they have been taken from the Potomac and introduced into the Delaware, Schuylkill, Lehigh and Susquehanna rivers. That their introduction into the former stream has been attended with success, is proved by the fact that a number have been taken during the past two seasons from Fancy Hill, a few miles below Philadelphia, to Belvidere. Many of these were much smaller than those introduced, and were doubtless their progeny. One taken at Fancy Hill during the past summer, was but three inches in length, and was exhibited by the captor (a young lad) to one of your commissioners as a new fish. This bass is a delicious table fish, attains to the weight of from two to five pounds, of rapid growth, exceeding prolific, and perfectly able to protect himself from all enemies, save man. It also belongs to the category of so-called game fishes, and is eagerly sought by the angler. Its capabilities for withstanding the dangers of transportation are remarkable, being equal, in this respect, to the cat fish, and almost to the eel. To the streams and mill-ponds of our country not already containing more valuable fishes, it would be a great acquisition.

The catch of herring during the past season has been unusually small—for this we have been unable to assign any satisfactory reason. Unlike the shad, they do not in our rivers ascend beyond the tide, but most possibly spawn upon grassy flats as described in the Report of the Maine commissioners, and quoted in our report to your Excellency for 1871.

It has been repeatedly noticed in all streams frequented by the shad, even before impassable dams and excessive fishing caused universal deterioration, that the catch was not equally great one season with another; may not the comparative scarcity which then occasionally existed have been owing to the occurrence of freshets during the height of the spawning season, whereby the ova were carried away by the turbid waters or covered with sediment, both detrimental if not fatal. For in

the words of the Connecticut commissioners (Report 1871, p. 11), success depends mainly upon three things: "perfect impregnation, constant motion of the ova, and freedom from mud or sediment." The two latter conditions being necessary that the ova may receive a sufficient supply of oxygen from the air contained in the water. Many causes in natural incubation tend to destroy the vitality of the impregnated fish egg, and the young fish upon its emergence from the egg at once is surrounded by numerous and voracious enemies. From the investigations of Seth Green, it would appear that but two per cent. of shad ova naturally impregnated are hatched.

In the month of June last one of your commissioners visited Mulls Fishery, upon the Hudson river, a few miles below Albany, where, under the auspices of the New York commissioners, the process of artificial impregnation and incubation of shad ova was being actively carried on. A thorough and careful inspection of the whole process was made, and your commissioners would strongly urge that system be introduced into the river Delaware during the coming season. That this method of re-stocking exhausted rivers is a perfect success is known to all, but the result in the Connecticut has been so pre-eminently successful, that as a typical example of the benefits of the system, the following from the Report of the Connecticut commissioners may not be deemed out of place:

"In the month of July, 1867, Mr. Seth Green, of Mumford, N. Y., under the joint patronage of the Massachusetts and Connecticut commissioners, made the first experiments in the artificial propagation of shad in the Connecticut river, a short distance below Holyoke dam. Mr. Green's skill and large experience in the culture of fish especially fitted him for the work. His first attempt resulted in hatching about two per cent. of the ova. His second attempt, with improved arrangements, brought out seventy per cent. His third effort secured ninety-nine per cent.; and in three weeks he put into the Connecticut river about forty millions of young shad. At this time nothing was really known about the growth of the shad; there was a great difference of opinion among fishermen and naturalists; some asserted that it reached maturity, or marketable size, in one year; others, that it took from two to five years. The better opinion seemed to be not less than three nor more than five years: and this was partially corroborated by the investigations of Mr. M. S. Treat, of Eastford, which showed that alewives, which are closely allied to shad, take four years to mature. It was also corroborated by the time of the disappearance of shad, after the building of dams. In the fall of 1867, more young shad were observed at various places along the river from Glastonbury to its mouth, on their way to the Sound,

than had been noticed for several years. The ferry boats on the river repeatedly scooped them up on their aprons, while many were caught by the fishermen in their fine meshed nets.

"In the following summer, June 20, 1868, Mr. Green repeated his experiments in the hatching of shad at Holyoke, under the direction of the Massachusetts commissioners, and for about twenty days had complete success. He turned out "several millions" of young fry daily. On the 12th of July, the weather became so extremely hot that the temperature of the water ranged from 84° to 88°, and the spawn was spoiled in the hatching boxes. It is estimated that sixty millions of young shad were put into the Connecticut that year.

"During the same year attempts were made by the Connecticut commissioners to hatch shad at Brockway's Point, but it was the 8th of July before the ova were placed in the boxes, and the extreme heat of the weather destroyed them.

"No attempts were made to hatch shad in 1869, the commissioners deeming it prudent to await the results of the experiments of 1867 and 1868, before incurring further expense. The great increase of young shad, seen in 1869, as in 1868, confirmed the belief that they would mature in due time, and an abundance of merchantable shad would appear by the year 1871 at the farthest.

"To the surprise and delight of our people, however, they appeared in unusually great numbers in 1870. Such a run of shad had not been seen in twenty years. On Sunday, the 22d of May, they appeared in the Sound in vast numbers; captains of vessels sailing through the Sound, reported immense shoals of them near the surface of the water, all making for the mouth of the Connecticut river. On Monday morning, the 23d, over twenty-eight thousand shad, of good size, were taken from the pounds at and near Saybrook. The same day, at Lewis' pound, beyond Nuncatesick Point, *three thousand five hundred and sixty were taken at one time*, being seven times the usual catch. At Haddam Island, seven hundred were taken at one haul of the seine. At Wethersfield, nine hundred were taken during the day. At Holyoke dam, four hundred and fifty were taken between 4 and 5 o'clock in the afternoon. At all the other fishing places on the river, so far as heard from, the catches were unusually large, and the fishing continued uncommonly good throughout the season. The average quality and size of the fish were also good.*

"Now, the largest hauls of shad in or near the Connecticut river, of which we have any authentic record, was in 1811, when *twenty-two hundred and eighty* shad were caught at a single draft

* May 18, 1871. Since the above was in type, reports have reached us that the fishing in the river is better than it was last year. Last week three thousand shad were caught at a single draft of the seine at Essex: and this week nine hundred were caught at one draft above Middletown.

at Ruddy's Fish Place. Prior to that time, the largest single draft had been made in 1802, at Haddam Pier, and it numbered about *twenty-three hundred*. Comparing these figures with those given above, from Nuncatesick Pound, it will be seen that the single catch last year at that place was larger by nearly 60 per cent. that the largest single draft ever before recorded.

"It cannot be positively asserted that this great run of shad was the result of the hatching of 1867. Your commissioners entertain the belief that it was; and there are certainly plausible reasons for such belief. It is a remarkable coincidence that such a sudden increase should appear just at the time many had predicted it and looked for it. It is a pertinent fact, too, that no other river shared in this abundance; the supply elsewhere was as scanty as in former years. Indeed it is only because this is the *first* attempt ever made to cultivate *shad*, that any doubt about these results would be entertained."

The expense of shad hatching in the river Delaware would be very slight. The main cost would be the purchase of the right to use the necessary apparatus. This is patented, but when once purchased can be used throughout the entire State. An appropriation of three thousand dollars would be ample to cover all expenses.

In spite of the ample testimony, based upon the observations of those who have been for years engaged in the artificial propagation of shad, that for proper incubation the ova requires both constant motion and clear running water, many of the practical fishermen of our State still cling to the belief that shad will spawn and their ova will hatch in any and every part of the river; declaring that they have seen them attached to sticks, stones, anchors and logs. The mistake arises from their confounding the spawn of other fishes with that of the shad. The spawn of the perch and carp family is attached in this manner, but of the shad never. The settlement of this question is of more than speculative interest, for if the ova hatch and the fry thrive alike in all and every condition of water, it matters not if the female fish be retarded and kept back by the innumerable gill nets till she is ripe and compelled to deposit her ova in the deep, turbid waters of the tide, or is debarred the clear running water above tide by means of impassable dams.

Upon the Raritan river, about a mile and a half from Bound Brook, the ascent of shad and other anadromous fishes, is, except during very high freshets, entirely prevented by a dam erected at that point by the Delaware and Raritan Canal Company for the purpose of supplying their works. In proof of this it may be stated that while numbers of shad are taken upon the river at various points below the falls, one thousand having been taken during the past season within a few hundred yards of that

structure, the capture of a shad above is of rare occurrence, not over fifty being annually taken. An attempt to prepare a fishway has been made, but as it is only opened when the water is high, is believed by your commissioners to be of no practical value. A properly constructed Foster fishway at this point is a great desideratum. A few shad were placed above the dam in June last by some well-meaning fishermen, but this, of course, can be attended by no good results as long as free access to the upper portion of the river is debarred. It is probable that but few shad have spawned in the Raritan river since the erection of the dam; the supply having been kept up by those drawn from the Delaware at Bull's Island, and discharged through the mouth of the canal at New Brunswick. These are yearly seen passing in immense numbers, though slightly less during the past than in the previous season.

The dam upon the Delaware at Lackawaxen has been examined and found to be of serious injury to the fishing interests, but being beyond the jurisdiction of our State, it is not in the province of your commissioners to more than mention their opinion of this structure.

From a combination of circumstances entirely beyond their control, the Trenton Water Power Company have been unable, as yet, to complete the fish guard across the mouth of their feeder, mentioned in our last report as being in progress of erection. It is hoped, however, that in our next report we will be able to announce the completion of this most useful structure. The number of young shad seen during the past season in the feeder has been very small.

Though no report was made to the Pennsylvania Legislature upon the bill forwarded them by your Excellency for concurrent action, an act was passed for the protection of fishes, in one clause of which all fish baskets were forbidden to be erected or maintained on any stream to which migratory fishes may now or in future have access. [Vide Appendix, No. 2.] This being concurrent with section 4 of the law passed by our Legislature March 15th, 1871, the abolition of these nuisances is now a fixed fact, and were it not concurrent, the jurisdiction of Pennsylvania, extending entirely across the river, would enable their proprietors to be prosecuted and the works to be destroyed, under the laws of that State. In the upper portion of the river are several of these structures, erected under licenses obtained from the county courts. Your commissioners have maintained that said licenses have been revoked by the passage of the general law, but no action has taken place for their removal.

The *alosu mattiwacca*, known as the fall herring, skip-jack, fall shad, and weesick, has, during the past autumn, been exceedingly common in our markets, large schools having been

seen and captured in Long Island Sound and Delaware bay. This fish resembles, in general appearance, our common shad, having the row of blue spots upon the side and fringed throat; the head, however, is somewhat smaller, and other points readily recognized by the naturalist, have been noticed. This fish is a constant visitor to our shores, but has never before appeared in such great numbers. It forms a valuable addition to our food fishes, and we sincerely hope that its visits may continue.

Besides the varieties of fishes already mentioned, which either permanently inhabit or ascend during the spawning season the river proper, there are others, inhabitants of salt water only, which make an annual visit from the ocean to the bay.

Of these the weak fish (*otolithus regalis*), deserves especial mention. It is found upon the whole of our Atlantic coast, from the Gulf of St. Lawrence to New Orleans, and it is by no means uncommonly met with at Martinique. It is known by a variety of names, especially by that of trout!—a sad misnomer. It is most commonly known as the weak fish, from the slight resistance it offers when hooked, and the facility with which the hook can be torn from its jaws. They make their appearance in the lower bay about the middle of May, and are captured during the entire summer. They are taken in great numbers by the shoremen and Kensington summer net fishermen. It is said that at least fifty tons of these fishes are annually sold in the Philadelphia market, at an average price of six cents per pound.

Closely following, and in fact preying upon these, comes the *temnodon saltator*, better known as the taylor fish, snapping mackerel or blue fish; these are captured during the same season, in the same numbers, and command the same prices as the weak fish.

The smelt or frost fish, *osmerus viridescens*, is captured during the spring in the tidal portions of the Delaware, Hackensack, Passaic and Raritan rivers, though in the latter alone are they to be found in sufficient quantities to render the fishery lucrative. The fish derives its common name (smelt), from its peculiar odor, resembling that of fresh cucumbers. When first taken from the water this is readily noted, and even after the fish has been some time dead may be detected by raising the gill covers. These fishes make their appearance at the mouth of the Raritan about the 10th of March, in large numbers, and continue until about the 15th of April. From the observations of the fishermen, it is believed that the spawning season is from March 20th to April 10th—the fishes taken after the latter date having generally cast their spawn. Five frost fish nets are used upon the river; these will average about four hundred and fifty feet in length by fourteen in depth. The mesh varies from three

quarters of an inch at the wings to one half an inch in the bag. Of these five nets two are owned by the Barteau family, and one apiece by Messrs. Flemmings, Wilcox and Lebonne. The quantity annually taken varies greatly, the largest haul on record having been made in 1868, when twelve hundred quarts were taken. The catch of last season was small—in fact the smallest known. The average catch of each net has been about sixty-four quarts, or two bushels per diem. Premising that the season affords twenty-five good fishing days, the catch of each net, per season, would be fifty bushels, and as the number of nets used is five, two hundred and fifty bushels would represent the quantity taken during the season. The average price obtained is twenty-five cents per quart, and the demand is far in excess of the supply.

The attention of your commissioners has been, during the past season, repeatedly called to the fact that the discharge into the streams of the refuse from refineries, gas works and India rubber factories, is exercising a most pernicious effect upon the fishing interests. In many cases, if the fishermen are to be believed, and we can see no reason for doubting their statements, have the spawning grounds been destroyed of many of our valuable fishes, beside rendering the flesh of the adults totally uneatable. This has been particularly noticed at New Brunswick, where the rapid decrease of the smaller permanent fishes is universally ascribed to this cause. And from our own observation, the shad captured in the Delaware below Philadelphia, frequently have a most disgusting taste of petroleum. It is believed that no intentional flow of coal oil enters our rivers from the large store yards in the vicinity of Philadelphia, but that the waste pipes of numerous gas works, refineries and factories, discharge directly into many of our streams, is as undeniable as that of the coal oil taste so disgusting to city epicures.

It is a significant fact that while establishments for the artificial propagation of fishes are springing up in large numbers in adjacent States, but one of any size and importance is to be found in New Jersey. The fish culturist is a public benefactor; spite of all his care, many fishes will escape from his preserves, and thus adjacent streams will become stocked. The mountains of the northern counties of our State abound in springs and streams admirably adapted for fish culture, and were private ponds properly protected by legal enactments, there is but little doubt that they would be speedily utilized. At present, the robbery of a private fish pond, or fish farm, upon which thousands of dollars have been expended, is but a trespass, and capitalists are chary of investing in those enterprises to which little, if any, protection is afforded by law.

In conclusion, your commissioners appointed to suggest such

laws as may be deemed necessary for the protection and preservation of fishes, would respectfully suggest—

First—The repeal of such clauses in the act passed by the Legislature of the past year as require the assent of Pennsylvania or conflict with the compact of 1783.

Second—The prevention of the defilement of the waters of our State, by the discharge into them of noxious materials from refineries, gas works or factories.

Third—The proper protection of such fishes of acknowledged economic value as may be or have been introduced into our waters.

Fourth—An appropriation of three thousand dollars for the purpose of re-stocking, by means of artificial impregnation and incubation, the rivers of our State with shad.

Fifth—The proper protection of the property of those engaged in practical or experimental fish culture.

All of which is respectfully submitted.

B. P. HOWELL, M. D.,
Woodbury, New Jersey.

J. H. SLACK, M. D.,
Bloomsbury, New Jersey.

APPENDIX No. 1.

FISHING CODE OF DELAWARE.

Be it enacted by the Senate and House of Representatives of the State of Delaware in General Assembly met: That

SECTION 1. It shall be unlawful for any person, not being a citizen of this State, to catch or take fish of any kind in Delaware Bay or River, or any of the creeks emptying into the same within the limits of this State, without first obtaining from the Clerk of the Peace of one of the counties, a license therefor, which license shall be granted on paying to the Clerk for the use of the State, twenty dollars, and shall be in force for one year from its date, and shall be confined to one boat or vessel named therein; *Provided*, That transient vessels may catch fish for their own immediate use. If any master of a boat or vessel, or other person, shall violate this section, he shall be deemed guilty of a misdemeanor, and shall pay to the State a fine of fifty dollars, and the boat or vessel used in such violation of the law, with all her tackle, apparel and furniture, and all her implements for fishing, gill-net or seine, or any contrivance for taking fish, and anything so taken shall be forfeited, and may be seized and detained for trial by any officer or person. Such trial may be had before any Justice of the Peace, and if condemned, the property seized shall be sold by his order, and the proceeds, deducting costs and charges, be equally divided among the captors; *Provided*, That an appeal shall be allowed from the judgment of the Justice, if applied for within ten days, to the Court of General Sessions of the Peace and Jail Delivery, on security being given by bond and sufficient surety, in the full value of the property condemned, conditioned to be void if such judgment be reversed by said court. Upon such appeal, a jury trial shall be had on the issue whether the boat or vessel seized has been used in violation of this chapter, and if it be found in the affirmative, the court shall affirm the judgment of the justice; otherwise such judgment shall be reversed, and the property seized shall thereupon be sold or released accordingly. The Attorney General shall appear for the captors and defend the appeal. Any Justice of the Peace shall, upon affidavit made that a boat or vessel is violating this chapter, issue his warrant to the Sheriff or Constable, command-

ing them or either of them to seize and detain such boat or vessel, and any Sheriff or Constable shall also have power under this act to make said seizure and detention without warrant, and in the performance of his said duty, may, if necessary, summon a *posse comitatus*, armed with firearms and ammunition, and use the same, if forced to do so, in execution of the law, and if maiming or death follows, it shall be considered justifiable, and the officer and his posse be free from legal responsibility. He may also require the assistance and use of any other boat or vessel, they receiving compensation as hereafter provided. It shall not be necessary that the affidavit shall state the name of the vessel or of the master; such names may be inserted in the proceedings after the seizure. The Sheriff or Constable shall be entitled to five dollars per day, and each person summoned by him and rendering him aid, two dollars per day, and for each boat he may require for his assistance, a just compensation, to be paid out of any property seized and condemned, or if not condemned, the officer or officers will be paid by the State. If any owner, master, or person belonging to, or on board of any boat or vessel, shall oppose or resist the Sheriff or other person in the execution of such warrant, or shall resist any lawful seizure of such boat, vessel, or other property, such person shall be deemed guilty of a misdemeanor, and shall pay to the State a fine of one hundred dollars. It shall be the duty of the Attorney General to cause any person indicted under this chapter, and who is out of the State, to be demanded and brought to trial.

SECTION 2. It shall be unlawful for any person not being a citizen of this State to catch or take fish in any river, creek, or pond within this State, and put them on board of any boat or vessel, not wholly belonging to and owned by citizens of this State, and the violation of this section shall subject the party offending to the same forfeitures and penalties, to be prosecuted in the same way as is provided in Section 1 of this chapter.

SECTION 3. It shall be unlawful for any person to lay out, float, or set, any gill seine or net, or any contrivance to catch shad, nearer than one mile from the shore, or mouth of any river or creek within the limits of the State, after the fifteenth day of June in each year, under the same penalties and forfeitures of Section 1 of this chapter.

SECTION 4. If any Sheriff or Constable refuses or neglects to serve the warrant issued by the magistrate for the execution of this law, or if any or all the posse he may summon to his assistance refuse to aid him, it shall be considered a misdemeanor, and he or they shall forfeit and pay to and for the use of the State the sum of ten dollars, to be collected as other fines and penalties are collected, and if any boat or boats shall refuse to render the assistance the Sheriff or Constable or other person

may demand, they, or each of them shall forfeit and pay the sum of five dollars, and forfeit the protection of this law.

SECTION 5. It shall be unlawful for any citizen of this State to get out a license for a citizen of another State, or in any way or manner combine with a citizen of another State to enable him or them to evade this law directly or indirectly, either by becoming a partner or assuming the ownership of nets, seines, or boats, and giving to the citizen or citizens of another State the control of, or profits arising from the fishing of said citizen or citizens of another State, and in case a citizen of this State should so evade the law, it shall be considered a misdemeanor, and he shall forfeit and pay the sum of one hundred dollars, to be collected as other fines and forfeitures are collected, one-half of which shall go to the State, and the other half to the informer after its collection.

SECTION 6. Every person who shall fish in the waters of this State, not a citizen thereof, shall on demand of any Justice of the Peace, Sheriff, Deputy Sheriff, Constable, or citizen within this State, produce the license thereof, and unless he shall do so it shall be presumptive evidence that he has no license and he shall be proceeded against as though he had none, but if when arrested and proceedings advanced it shall be found he has a license, but refused to show it on the above demand, he shall be fined five dollars for such refusal, to be collected as other fines and forfeitures.

SECTION 7. It shall be unlawful for any person to have in his or her possession, or expose for sale, any shad caught in the River Delaware or its tributaries, within the jurisdiction of this State, above the southern point of Reedy Island, between the eleventh day of June and the tenth day of August in any year, under a penalty of five dollars for each and every shad so had in possession or exposed for sale, to be recovered in an action of debt with costs of suit, by any person or persons in his or their names before any Justice of the Peace in the county, or where the defendant resides or lives, and in all prosecutions or proceedings under this act, it shall not be necessary to file any state of demand or to comply with the formalities required in penal actions, and in all such actions both parties may be sworn. One-half of said penalty shall be paid to the informer.

SECTION 8. It shall be unlawful for any person to make use of any gill-seine of a less mesh than ten inches for the purpose of catching fish in the river Delaware within the jurisdiction of this State, above the southern point of Reedy Island, between the tenth day of June and the tenth day of August in any year, and he, she, or they, so offending, shall forfeit and pay the sum of one hundred dollars, together with costs of suit, for each and every offence, and one-half of said penalty shall be paid to the informer.

SECTION 9. It shall be unlawful for any person to cast, draw, fasten, or otherwise make use of any net, trap, device, or contrivance for the purpose of catching fish in the river Delaware, or of the Bay thereof, within the jurisdiction of this State, between the hours of sunset on Saturday and midnight of Sunday, throughout the year, and he, she, or they, so offending, shall forfeit and pay the sum of fifty dollars, together with costs of suit for each and every offence, and one-half of said penalty shall be paid to the informer.

SECTION 10. All fines and penalties collected under this act, after deducting the amounts due to the informer, and the costs of the suit, shall be paid to the State Treasurer for the use of the State.

Passed at Dover, March 28, 1871.

S. C. BIGGS,
Speaker of the House of Representatives.
CHAS. GOODING,
Speaker of the Senate.

A SUPPLEMENT TO THE ACT ENTITLED "AN ACT FOR THE PROTECTION OF FISHERMEN."

Be it enacted by the Senate and House of Representatives of the State of Delaware in General Assembly met:

SECTION 1. That it shall be unlawful for any resident or citizen of this State to catch or take any shad for the purpose of sale, in Delaware River or Bay, or any of the creeks or rivers emptying into the same, within the limits of this State, without first obtaining from the Clerk of the Peace of one of the counties a license therefor, which license shall be granted on paying to the Clerk of the Peace aforesaid, for the use of the State, five dollars, and shall be in force for one year from its date, and shall be confined to one boat or vessel named therein.

SECTION 2. That all the provisions of the act to which this is a supplement shall, with the exception of Section 1 of said act, be applicable to residents or citizens of this State.

Passed at Dover, March 29, 1871.

S. C. BIGGS,
Speaker of the House of Representatives.
CHAS. GOODING,
Speaker of the Senate.

APPENDIX No. 2.

LAWS OF PENNSYLVANIA OF THE SESSION OF 1871. NO. 47.

SECTION II. On any of the streams or parts of streams contemplated by this act, and under the jurisdiction of this Commonwealth, to which anadromous or migratory fishes shall now have access by the non-existence of dams, or by opening in the dams, whether intended or not to facilitate such access, and in whatever of the reaches or spaces below or between dams, such planting of new species shall have taken place as is herein contemplated, the sheriffs of the counties having jurisdiction of such reaches of the streams, whenever they shall discover or be informed of the existence of such contrivance for the catching of fish as are commonly known as fish baskets, eel weirs, kiddles, brush or fascine nets, or any other permanently set means of taking fish, in the nature of a seine, which are known to be wasteful and extravagant modes of fishing, the said sheriffs shall give notice in two newspapers of their respective counties, that the said contrivances are known to exist and are declared common nuisances, ordering them to be dismantled by their owners or managers, so as to render them no longer capable of taking or injuring the fishes of the streams of whatever kind; and if, at the expiration of the said ten days, the dismantling shall not have taken place, then the said sheriffs shall proceed with such force, good men of the county, as may be necessary for the purpose, and destroy or dismantle the said fish baskets, eel weirs, or such other devices contemplated by this section, so that they may be no longer capable of taking or injuring fish, and the accounting officers of the counties shall make good the cost of the said proceedings to the said sheriff or sheriffs in the settlement of their accounts with said sheriffs; and if, upon being duly informed by a reputable citizen of the county that said nuisances are in existence and require abatement, the said sheriff or sheriffs shall not proceed as directed in this act, then he or they, upon conviction in the county court of said neglect of duty, shall be fined not less than one hundred nor more than one thousand dollars for every such neglect; said fines to be collected as ordinary fines are collected, and the proceeds divided equally between the informer or complainant and the school directors of the proper district, for school purposes only; this section is not intended to supersede any other law of this Commonwealth for the suppression of fish baskets, et cetera, if the same be found efficacious to destroy or abolish them.

Approved May 24, Anno Domini 1871.

APPENDIX No. 3.

NAMES AND ADDRESSES OF COMMISSIONERS OF FISHERIES
AT PRESENT HOLDING OFFICE.

United States—Spencer F. Baird, Washington, D. C.

Maine—C. G. Atkins, Augusta.

New Hampshire—W. E. Sanborn, Weirs; W. W. Fletcher, Concord; T. E. Hatch, Keene.

Vermont—M. C. Edmonds, M. D., Weston; M. Goldsmith, M. D., Rutland.

Massachusetts—Theodore Lyman, Brookline; E. A. Brackett, Winchester; Thomas Talbot, North Billarica.

Connecticut—W. M. Hudson, M. D., Hartford; R. G. Pike, Middletown; J. A. Bill.

Rhode Island—Newton Dexter, Providence; S. S. Foss, Woonsocket.

New York—Horatio Seymour, Utica; George M. Cooper, Rochester; R. B. Roosevelt, New York.

New Jersey—B. P. Howell, M. D., Woodbury; J. H. Slack, M. D., Bloomsbury.

Pennsylvania—James Worrall, Harrisburg.

Virginia—W. B. Ball, Richmond.