

4.—THE DECREASE OF FOOD-FISHES IN AMERICAN WATERS AND SOME OF THE CAUSES.

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In a country like ours, any question relating to the general increase or diminution of wholesome food, of whatever kind, possesses or should possess interest for all. Our food resources are so vast and so varied that we are apt to regard them as almost inexhaustible, and hence many are less careful of them, less disposed to be economical in the use of them, and more likely to indulge in their abuse than were they more limited. Under the influence of such belief, our great forests are rapidly disappearing, millions of acres of once fertile lands have been cropped to impoverishment and turned out to await nature's recuperative influences; the buffaloes, once almost countless in numbers, have been practically exterminated; game animals and birds are steadily becoming more and more scarce, and many other of our natural resources have either been completely exhausted or greatly diminished by the belief in their inexhaustibility, or rather by the wastefulness and prodigality which, unfortunately, are to be classed among our national characteristics.

Among the many sources of wholesome food supply that have suffered, that of edible fish may be mentioned as specially prominent. While, to a great many, such an assertion would seem to lack verification, it is readily susceptible of demonstration; "confirmations, strong as proofs of holy writ," abounding in every direction.

Taking a map of the United States and noting our many majestic rivers, some of the largest in the world; the thousands of lesser magnitude and their innumerable minor tributaries, all capable of maintaining an immense amount of fish life; our chain of unrivaled lakes, equaling seas in area, with the many others of lesser note, and our thousands of miles of sea, gulf, and bay coasts, it may well seem incomprehensible, to those who have never given the subject serious thought, that with such extensive and varied waters there could be a possibility, even, of a scarcity of food-fish, either present or prospective. What adds to the incomprehensibility is the fact that within the memory of many now living, those streams, lakes, and coasts, almost without exception, teemed with food-fishes. Some of them are still prolific in that respect, but it is a deplorable truth that a very large proportion of them—those inland especially—have been either almost entirely depleted, or their productiveness so diminished as to practically amount to depopulation. If reliable statistics of the

fish products of American waters fifty years ago were procurable, and compared with accurate statistics of the same waters to-day, the discrepancy would be startling.

That this alarming condition of our fishery resources has not been permitted to escape the attention of some of our more thoughtful people is evidenced by the fact that every State and Territory having any such resources has enacted laws for their protection and preservation, and twenty-one of them have one or more hatchery stations for the purpose of providing, by artificial means, young fish for the restocking of the depleted streams. These well-meant endeavors to arrest further diminution have, unfortunately, been only partially successful. This failure has been largely disappointing, for great results were expected from the carefully framed and very stringent statutes, as well as from the distribution of millions of young fish annually from the State hatcheries and from the national hatcheries under the control of the U. S. Fish Commission. Those hatcheries, national and State, have, under competent supervision faithfully and effectively carried on the work of artificial propagation, and their products have been judiciously used in restocking.

An idea of the extent of their operations will be gleaned from the following statistics of the propagating and distributing operations of the hatcheries of the State of Pennsylvania:

Species.	1890.	1891.	1892.
Shad	16,303,000	8,457,000	9,000,000
Brook trout	2,694,900	2,508,000	3,200,000
Salmon	94,000	300,000
Lake trout	168,000	196,500	175,000
Landlocked salmon	49,000	170,400
Black bass	840	3,895	6,000
Carp	4,525	5,679	6,000
Grass bass	1,325	2,000
Whitefish	10,100,000	11,770,000	30,000,000
Wall-eyed pike	13,545,000	40,600,000	65,000,000
California trout	508,000	523,500	522,000
Total	43,467,865	64,236,299	108,211,000

In connection with the foregoing statistics it may be stated that the product of the Delaware River increased from \$80,000 in 1881 to over \$500,000 in 1891. The value of the fishery production in Erie, the only lake fishery port of Pennsylvania, increased from \$65,000 in 1885, at which time the whitefish hatchery was first started, to \$500,000 in 1892. It is therefore clear that the failure referred to can not be attributed to remissness on the part of those having supervision of the hatcheries, though probably the output and distribution from those in Pennsylvania were larger than those of most of the other States.

To what cause or causes, then, are to be charged this nonfulfillment of expectation in regard to the results of such extensive propagation and restocking? Except in a few cases, we have nothing to indicate that there has been any marked increase of fish products or that the generally prevailing decrease has received any material check.

I propose now to briefly consider some of the many causes that have contributed, in a greater or less degree, to the reduction of the food-fish supply, beginning with those that have served most largely to render the fishery laws so nearly nugatory.

First among them, is the widespread lack of comprehension of the vastness of the fishery interests of this country—their real money value. The long-continued and still-prevailing barrenness of so many of our waters is regarded by the majority as a natural

result, something to be accepted as inevitable and therefore remediless. This idea is especially prevalent among those of the present generation who, having never been familiar with the former prolificness and having never given thoughtful consideration to the subjects of artificial breeding and judicious restocking with subsequent protection, conclude that attempts at replenishment will prove futile. Having never known what is meant by fresh-fish plentifulness, they believe, or profess to believe, that money and effort spent for food-fish increase are simply money and effort wasted. They fail to comprehend the possibility of checking the decrease and of supplementing it with such an increment as will repopulate and restore productiveness, regarding it as a chimera. They have failed to grasp the idea that such restoration would add millions to the value of the country's resources and enable themselves and thousands of others, who have never known the luxury of partaking of fish taken from home waters, an opportunity for the enjoyment of such a treat.

Another very prevalent idea is, that the fish in public waters are the inherent property of the people, and may be taken at all seasons, wherever found and by whatever means. Fish protective laws are therefore naturally regarded by persons holding those opinions as positive infractions of popular rights, and as such, not only entitled to no respect, but should be resisted. To arrest a violator of them is looked upon as an outrage, and the officers of the law who cause such arrests are considered tyrants. Although it is the sworn duty of wardens, magistrates, and constables to have all offenders against fishery statutes brought to justice and punished, it needs not the saying that such sworn duties are rarely performed and that infractions being thus winked at by the authorities, the laws are brought into contempt.

Pollution of streams.—Another and a very prominent cause is the pollution of streams. Fish of all other living creatures have a detestation of impure water. It is the element in which they live and move and have their being. In the order of nature the water in which a fish is brought into existence is adapted to that fish's life. To assume any other condition of things would be an impeachment of the wisdom of the Creator. This, of course, applies to waters in their original condition, before civilization with its many contaminating influences intruded upon them. Naturally, therefore, when the sawdust from sawmills, the refuse from gas works and tanneries, the sewage from cities and towns, the deleterious drainage from manufactories, the pumpings from mines, etc., are deposited in or allowed to flow into streams, the result must either be the poisoning of the fish or the driving of them to more congenial waters, and the consequent depletion of those streams in which they would have lived and multiplied had they been permitted to do so without molestation.

Almost without exception the fishery laws of the States are emphatic in their prohibition of such contamination, but it is a fact established beyond all controversy that the instances in which the prohibition has been respected have been very rare indeed. Instead of regarding the water-courses as sources of health to human beings as well as to fish, they are deemed fit places of deposit for noisome and noxious materials of whatever kind that can be most conveniently disposed of through their agency.

Dams.—The erection of dams in streams frequented in their season by anadromous fishes has been generally exterminative of such fishes in the waters above such obstructions. A great many of the dams now in existence were built years prior to the enactment of fishery laws prohibiting such structures, except with a certain

proviso. That proviso is, that the owners of dams that obstruct the ascent of fish shall place in each a fishway or fishways, so constructed as to afford ready passage-way for anadromous and other fishes, whose habits incline them to ascend to the upper waters of the stream. The penalty for the violation of this statute is heavy, but like so many of the other fishery laws, its commands are more honored in the breach than in the observance.

The hurtful influences of these obstructions, where the law in regard to them is not respected, can readily be imagined. Even where there is compliance the compensation is generally only partial. A practical illustration of this is found in the Susquehanna River, which once abounded for several hundred miles of its length with shad, which for size and quality were unsurpassed. A dam was erected across that river at the town of Columbia, and thereafter the presence of shad in the waters above it became almost unknown. Prior to its erection your speaker saw more shad taken a mile above its location at a single haul of a seine than were afterward caught in the river northward in any entire season. This condition of things prevailed until the State fishery commissioners, some six or seven years ago, ordered the placing of several of the latest improved fishways in the dam. Since then some shad have been taken in the upper waters of the river, but it is questionable whether, even with these added facilities for the ascent of shad, the annual product has been materially increased, though better results are confidently anticipated; but there is little room for hoping that the former noted fecundity of the Susquehanna will ever be restored.

Fish baskets.—In the Delaware and Susquehanna rivers, and in nearly all of their principal tributaries and doubtless in many other rivers of rapid flow, fish baskets have been and still are to be found, than which it is impossible to conceive of any device more destructive to anadromous and migratory fishes. Through the energetic efforts of the Pennsylvania State fishery commissioners, they have been very nearly exterminated in the first of the two rivers named. Those baskets with their diverging wing walls, which obstruct the progress of the young fish seaward, compel them to seek passage at the point where the walls converge and where the basket is placed. Instinctively, the fish press onward and are often taken by thousands in the deadly trap. Instances have been known in the upper Delaware, where so many young shad were intercepted in fish baskets—of course, perishing there—that farmers hauled them away by wagon loads, using them for fertilizing purposes on their fields.

It has been estimated that before the interference of the State authorities as many young shad were destroyed through the agency of fish baskets each season as twice equaled the entire catch of mature shad in the Delaware.

Fyke or hoop nets.—Scarcely less destructive is the fyke net, which corresponds in character and intent with the fish basket, but because of the shortness of its wings is adapted only to smaller streams. Placed at the mouth or in the narrow channels of minor streams, it commands the entire passageway, and of course captures everything in the shape of a fish that attempts a descent.

The fyke net, like the fish basket, is strictly prohibited by law, but being portable it is readily placed in position at convenient times, and as readily removed and hidden away, if there is reason to anticipate a visit from any of the authorities. Detection, even if intended, is therefore difficult.

Betterton, at the mouth of the Sassafras River, on the eastern shore of Maryland, a few years ago was celebrated for the size, quality, and quantity of its white perch.

Four or five hundred, aggregating nearly as many pounds, were not an unusual single day's catch for two hook-and-line fishermen, but the fyke was introduced by the commercial fisherman, and to-day the man is lucky who succeeds in capturing two or three dozen of less than half a pound weight each. The glory of Betterton has departed.

A natural supposition would be, that men who earn their living by fishing would, on the score of self-interest alone, endeavor by all means in their power to prevent the fish products of the waters in which they ply their vocation from decrease. Generally speaking, the reverse of this is the case. In the immediate vicinity of the Betterton waters, perch used to be taken in small-meshed seines in large quantities, thousands of other fish, and especially young perch of unsalable size, being captured with them. Instead of being returned to the water, as they should and readily could have been, those unmerchanted fish were dumped upon the beach to die; furnishing tempting feasts from day to day to hundreds of hungry buzzards. These facts are given for the purpose of illustrating some of the many fish-exterminating methods practiced in thousands of places.

Explosives.—Another illegal, unnatural, and most indefensible method of killing fish is by the use of explosives, such as dynamite, giant power, etc. The placing and exploding of a dynamite cartridge in a pool of water means not only the killing of the larger fish, but not unfrequently of hundreds, sometimes thousands, of smaller ones. The dead fish rise to the surface, the larger ones being secured while the much greater number of smaller ones are borne away by the current. This reprehensible way of killing fish receives special mention in the restrictive laws of nearly every State; but dynamite cartridges and other explosives are so readily obtained now, so easily hidden from observation, and require such little preparation for their illicit use, that it is almost impossible to detect the guilty parties; therefore their employment for fish-killing purposes is much greater than is generally supposed.

The foregoing are some of the leading causes of the decrease of food-fishes in American fresh waters. There are numerous others of minor importance individually, but in their aggregate producing a vast amount of injury to fish life. Among them may be named the little respect which is paid by hook-and-line fishermen to the "close times"—the season when the fishes to which they specifically apply do their spawning. It is a fact, not as generally understood as it should be, that fishes of certain kinds, possibly all, when in a gravid condition take the bait much more readily than at any other period, and much more readily than the males. An adult female taken at such a time means the absolute destruction of from five hundred to one thousand germs of fish life; in some varieties, many more. How many gravid fish are taken every year can not of course be even conjectured, but from the number of poachers the total must run into a great many hundreds of thousands. This is the more to be deplored for the reason that the killed germs would have been naturally spawned and, through the instinct of the parent fishes, in localities better suited to the wants of the young fish and where they would have better protection and thrive better than artificially propagated fry, planted in waters assumed to be suitable, but which in fact may be the least adapted to their safety and growth.

The "pot hunter" is another deadly enemy to fish increase, as he counts all as fish his hook captures, whether they be fingerlings or pound weights. Instead of returning to the waters the small and worthless fish, he gives them a place in his creel in order that the count of his catch may be swelled to its utmost proportions. Such

small ambition possesses many who would like to be deemed sportsmen, but whose rightful designation is "pot hunters."

Is it remarkable, then, in view of the many causes inimical to fish life that have been named, together with the still more extended catalogue of minor ones, that there has been a constant decrease of food-fishes in our inland waters, resulting in many cases in entire extermination?

SALT-WATER FISHES.

Turning from fresh-water to salt-water fishes, it is a question with many—some of them scientists of the highest repute, who have given the subject attention—whether there has been a decided diminution. However that may be, there are some facts, serving to show a temporary decrease at least, that merit consideration.

It is well known that migratory fishes—the herring and the mackerel for instance—suddenly appear or disappear at various points and intervals along the coasts, the causes of their appearance and disappearance alike lacking satisfactory explanation, some observers attributing the latter to continued tempestuous weather, others to the temperature of the water; but there is, I believe, no general agreement on the subject.

There are other varieties of coast fishes whose sudden comings are as mysterious as those of the herring or the mackerel, but whose departure is more gradual, and whose first plentifulness is not repeated in the subsequent year. Some twenty years ago immense multitudes of croakers suddenly swarmed along the coast of New Jersey. Although constant residents of near Southern waters, they were entire strangers to the oldest Jersey fishermen. What specific influences caused their presence in such countless numbers has not yet been explained. They were readily taken in any desired quantities with hook and line. They reappeared the following summer, but in sensibly diminished numbers, the diminution continuing from year to year, until to-day they are only occasionally captured. The cause of their gradual disappearance is as much a mystery as their sudden first arrival.

Squeteague or Weakfish.—Thirty or forty years ago the coast of New Jersey and its estuaries fairly teemed with squeteague or weakfish, but year by year their numbers have been steadily decreasing. There was a time, which extended through a number of years, when such a thing as scarcity of that favorite fish was unknown. The decline was specially noticeable last summer. A season of like scarcity is not remembered. Very few were taken in the estuaries, save in May, when they appeared in sparse numbers. A large proportion of those taken were captured in pound nets, weirs, and with seines, the majority of them being in a gravid condition. It was specially noticeable that the spawners eagerly took the bait offered them by hook-and-line fishermen, the males persistently refusing it.

That the killing of so many gravid fish thus early in the season for years previous had the effect of curtailing their numbers in subsequent seasons can not be questioned; but the curtailment was not sufficient to account for their steadily increasing scarcity. That it was a contributory cause must be admitted, and for that reason restrictions upon early spring fishing for them should be made part of the laws of New Jersey.

By some close observers last season's decline was attributed to the attacks of the bluefish, which no doubt had something to do with it, but that they were a principal cause is refuted by the fact that, during the period referred to, bluefish had decreased

in about the same ratio. The almost entire absence of squeteague in the estuaries, their usual haunts until ready to migrate southward, is thought by some to have been due to the scarcity of their usual food supply, resulting from the intensely cold weather of the previous winter, and there is some reason in the opinion. But, as will presently be shown, there are other deeper-seated and farther-reaching causes.

Bluefish.—About sixty years ago, after a long absence, bluefish appeared in great schools along the Jersey coast. Then, as ever, they displayed the same insatiable voracity that has earned for them the appropriate designation of “unmitigated butchers.” They increased in numbers with each succeeding season until about twenty years ago, when their plentifulness seemed to have reached its climax. It is on record, about that time, that in a single day one fisherman, handling three lines, caught 265 in Barnegat Bay; the day following, 261. It was not unusual for a party of two or three to take as many hundred in six or eight hours fishing. But, like the squeteague, they have steadily lost numerical strength. They are rarely seen now in Barnegat or any other of the bays on the coast. More of them were taken in a single season than than have been caught during the whole of the past ten years.

It would be hazarding little to assert that the number of bluefish on the coast for the past decade, as compared with that of twenty years ago, is ten to one in favor of the latter. Why this remarkable decrease? It has certainly not resulted from trolling hooks, nor from pound nets or weirs. It can not be reasonably charged to a lack of food, as the bluefish is such an expert hunter and such an indiscriminate feeder that even though its menhaden resources have been largely reduced, there are other sources of supply upon which it can draw, the kind or quality being seemingly of trivial importance, provided there is enough. Naturally, less aggressive food-fishes are prominent among those that suffer from its attacks, and here we have another contributing cause to the prevailing scarcity of the edibles.

The Menhaden.—The menhaden can not properly be classed among the food-fishes, though there are some that give them a place at their tables. They, however, play such a conspicuous part in the subject under consideration that they demand special attention. A prominent writer on ichthyology says of them:

It is hard to surmise the menhaden's place in nature; swarming in waters in countless myriads; swimming in closely packed unwieldy masses, helpless as flocks of sheep, near to the surface and at the mercy of every enemy; destitute of means of defense or of offense, their mission is unmistakably to be eaten.

That paragraph was written some ten years or more ago, and is as true in every essential, save two, to-day as when it was penned. One of the exceptions is that of the “countless myriads.” There are still great numbers of menhaden along the coast, but few compared with their former extraordinary abundance. The second exception is that “their mission is unmistakably to be eaten.” While they are still the helpless prey of all the larger carnivorous fishes, another use has been found for them. They have formed the basis for a great industry. Millions of capital are invested in it, and, like many other American enterprises, it has been and is being prosecuted with such energy that a few years more of like effort will warrant the assertion that an approximation to extermination will be the result. Already the decrease is so marked that a number of the vessels employed have been withdrawn, the scarcity this season having rendered their further use unprofitable. This diminution has not been the result of one of those sudden and inexplicable fluctuations that characterize the

movements of some of the migratory fishes, but, as will presently be shown by reliable statistics, has been a natural sequence to the unrelenting warfare waged upon them.

No other industry of the country has evoked a greater amount of unsparing condemnation. Public indignation has been righteously arrayed against it, though up to this time it has not taken on the concentrated form essential to a proper recognition of the abuse. A convention of representative men from several of the seaboard States has been called by a large number of prominent citizens of New York, for the purpose of considering the cause or causes of edible coast fish scarcity. What will be the outcome of that convention remains to be seen, but the fact is noteworthy that it will be the first regularly combined movement having for its object the correction of an undeniable evil.

Ordinary familiarity with the subject and a little thoughtful consideration will convince every unprejudiced mind that the time for the correction of this great public wrong has come, and that further delay in regard to the righting of it can hardly be looked upon as less than criminal.

The great original abundance of the menhaden is one of those wise provisions of the Creator for the maintenance of certain kinds of edible fish life. The shark, the swordfish, bayonet-fish, and other of the larger "corsairs of the sea" indigenous to the Atlantic coast, satisfy their ravenous appetites by indiscriminately slaughtering and devouring menhaden and, when opportunity offers, edible fish also. Why those large carnivoræ are thus provided for, and what are their special uses, are questions that need not be considered now. It would be ridiculous, nay, almost sacrilegious, to assume that each one has not a mission to perform, whatever that mission may be. Then again, the larger of the carnivorous food-fishes, as the striped bass, squeteague, bluefish, pollock, cod, bonito, and others, are the deadly enemies of the menhaden, feeding mainly upon them, in their season. These menhaden-eaters, finding their natural food supply diminished, prey upon each other, the stronger and more agile overpowering the weaker, and all of them devouring the smaller edible varieties when opportunity offers.

When the number and voracity of the larger carnivoræ of the coast are considered, the amount of food required to support them and the readiness with which they capture it, the number of fish destroyed by them in consequence of the increasing scarcity of menhaden can best be understood by the steadily decreasing edible coast fishes. The opinion of the writer already quoted, that the mission of the menhaden is "unmistakably to be eaten," is undoubtedly correct, just as would be the declaration that the mission of the carnivoræ of the sea are to be the eaters. But for the carnivoræ, the sea would have long since been a vast pest-pool, so great is the fecundity of the menhaden. They, the carnivoræ, devour so many of them that such injurious multiplication is prevented, and food-fish protected from their deadly assaults. But, when menhaden fishermen interpose with their purse nets, nature's equilibrium is destroyed. If it be asked why the menhaden did not multiply to a hurtful extent prior to the establishment of the fisheries that have been so rapidly depleting them, the answer is, that nature's laws are inflexible and not always readily explained. She permits no infractions of them without revenging herself, though, as in this case, her penalties are not always imposed on the transgressors, but on innocent parties.

That the menhaden supply is being exhausted needs not the saying. Those who were familiar with the coast waters twenty or thirty years ago and are familiar with them now will bear testimony to the fact that during the period referred to it was an extraordinary occurrence if, in sailing through them only for the distance of a mile, vast schools of menhaden were not encountered. A paper before me, furnished by a leading menhaden fishery proprietor, states that at times his boats have steamed 800 miles along the coast without taking a single fish. Such facts speak for themselves. This acknowledged scarcity, whatever may be said to the contrary by the menhaden fishermen, can not rightfully be classed among the fluctuations which mark the movements of such migratory fishes as the mackerel, the herring, and others. The decrease has been gradual, keeping even pace, in inverse ratio, with the increase of the menhaden fisheries, and showing conclusively that if there were ten times as many menhaden in the coast waters twenty years ago as now, as there undoubtedly were, the falling off is justly chargeable to the purse net. The injury already done is not, however, remediless. If the purse net were entirely forbidden by law, or its use placed under judicious restrictions, the damage thus far caused by it might in time be repaired by nature's restorative processes, but as long as the present system is tolerated there is no room for hope of such restoration.

It is a striking coincidence that the decrease of coast fishes began to manifest itself about the time when menhaden fishing first assumed formidable proportions, and it has kept abreast with the work of extermination until, as has already been stated, there has been a growing decrease of edible fishes, which, as far as inside coast waters are concerned, amounted, during the past summer, to practical extermination, and moreover there never were so few menhaden taken.

There is another evil connected with menhaden fishing which merits notice. The formidable purse nets, which are usually 100 feet in depth and 1,800 feet in length, capture not only menhaden, but great quantities of edible fish, which, instead of being separated from those valueless for food and sent to market, after the wants of the crew are supplied, are ground up for oil and fertilizers. This is denied by the menhadenites, but hundreds of witnesses to the truth of the allegation could, if necessary, be furnished—witnesses who would show that bluefish, squeteague, sheepshead, croakers, porgies, striped bass, sea bass, drum, tautog, and nearly every other variety of coast fish are captured by them and utilized as stated.

Replies to these charges have been attempted, and to those not familiar with the facts they will appear plausible. To illustrate, a single affidavit was read before the Congress in which the affiant, who was understood to be a reporter and a passenger on board a menhaden fishing boat, avers that during the entire trip not more food-fish were taken than were needed to supply the table wants of the crew and their only passenger. That such might have been the case is within the range of probabilities. The nets, intentionally or otherwise, may have been cast in waters where edible fish were not plentiful. Therefore, the argument, if an argument it can be called, goes for nothing.

Again, it was alleged that the proprietors of the boats would be grossly unmindful of their interests if, instead of sending the many food-fish said to be taken in their nets to the New York markets, where they would command from 8 to 10 cents a pound, should send them to their factories, where they are worth only a cent or two a pound. That would be poor economy if the food-fishes taken could be disposed of at the prices

named; but, for several very conclusive reasons, they could not. It was forgotten to be mentioned that menhaden fishing is mainly carried on during the summer months when edible fish are most plentiful and very perishable; that the average time consumed in a fishing trip is from three to six days, some of them exceeding the longest period; that the menhaden boats rarely, if ever, carry ice in sufficient quantity to preserve, for any length of time, any food-fishes that may be taken; that of all places in which food-fish should be kept, a noisome fishing boat, with its putrefying, unsavory contents, would be the last, and that even if they were not tainted by such surroundings their sale in New York, under such circumstances, is prohibited by law. These plain facts completely abolish that line of defense.

Again, it was argued during the discussion that, with two or three exceptions, the edible fishes of the coast are of the bottom varieties, and, therefore, readily escape from the nets. In answer to this most preposterous argument it is only necessary to state that, generally speaking, the bottom of the sea where menhaden fishing is done is nearly as smooth as a floor. Never, or very rarely, is purse-net fishing attempted in water approximating even to 100 feet in depth. The heavy leads carry the net to the bottom and keep it there. With those leads dragging on the smooth bottom of the sea, the idea that fish, startled by their approach, would attempt to escape beneath them is simply an absurdity. A fish of any kind startled by the approach of the leads seeks refuge by fleeing from instead of toward them, and naturally rises toward the surface. Being intercepted on its course upward by the meshes of the net and by the closing of the deadly purse below, escape is rendered impossible.

Another favorite argument is that the source of menhaden supply is inexhaustible. It is the identical plea that was offered by those who exterminated the buffalo; by those who denuded the forests of Pennsylvania, Michigan, the Southern States, and who are now carrying on their destructive work in the great forests of the Pacific States. The salmon supply only a few years ago was declared inexhaustible, but grim experience has demonstrated the fallacy of such belief. The Columbia River, once the most celebrated salmon stream in the world, has been robbed of its fruitfulness, and the Frazier River supply is rapidly being reduced to a like condition. In order to protect Alaskan rivers from similar depletion, the Government is appealed to for the enactment of restrictive laws.

In this age of greed and of ingenious devices there does not appear to be any natural resources for which there is a market, and the marketing of which will afford a profit, that can properly be considered inexhaustible, and the menhaden supply is certainly not an exception.

In view of such cogent and impregnable facts, is it surprising that the food-fishes of the coast north of Chesapeake Bay are decreasing? In the Delaware Bay, about 8 miles above Cape May, are the "drum-beds," once the finest of fishing-grounds. Squeteague and drum formerly abounded there in their season in such quantities that hand-line fishermen nearly supplied the Cape May market with them. The menhadenites invaded those beds with such effect that fishermen no longer visit them and meet success.

New Jersey made a vigorous effort to abolish the hurtful industry, but its legislative enactment was declared unconstitutional. Another effort to secure its abolition by Congressional action met with failure.

Pound nets.—Another device, injurious in the highest degree to food-fish plentifulness along the seacoast, is the pound net, which of late years has assumed most formidable proportions and which threatens to become still more destructive. Not only have those nets increased immensely in size, but they have multiplied to an extent that certainly calls for legislative interference.

These destroyers of edible fish are placed as early as April and, as they extend a long distance into the sea, intercept tens of thousands of migratory fishes on their way northward. Most of the captures are of spawning fishes, and are mainly sea bass and squeteague, though many other varieties are taken. The nets are continued in position until fall, when the young fish spawned northward of them commence their southward journey. As those young fish generally keep near the shore, they become the victims of the nets, in which they perish by hundreds of thousands—it would not be exaggeration to say millions. That some concentrated and determined effort has not been made to either define the seasons when they can be employed or, what would seem to be more advisable, forbid their use entirely, is surprising. They exceed menhaden fishing in their injurious effects upon edible-fish life. The damage to the edible-fish supply from Sandy Hook to Albemarle Sound has become so marked that a combined effort is about to be made to induce Congressional legislation that will afford the much-needed relief.

SOUTHERN COASTS.

Southern coast waters have, for several reasons, suffered less than Northern. Population is comparatively sparse and consequently the home-market demand for fish is limited; the generally prevailing heat of the weather, the scarcity of ice for packing purposes, and the lack of sufficiently rapid transportation to the great city markets of the North discourage extensive fishing operations. Commercial fishing is therefore an industry restricted to a few months of each year, and necessarily not of great extent nor specially injurious to the natural resources.

PACIFIC COAST.

The marvelous abundance of salmon on the Pacific coast naturally led to the impression that the supply was inexhaustible. This belief, coupled with their great commercial value and the comparative ease with which they were taken, immediately attracted the attention of capitalists. Fisheries were established, canneries on a large scale erected, and the work of destruction began. For a number of years the idea of inexhaustibility was still entertained, but the inroads made upon the immense schools that periodically came from the sea to do their spawning in the fresh waters made it apparent that unless some restrictions were placed upon fishing operations, and close seasons ordered and respected, the time would come when salmon plentifulness would cease. Restrictive laws have been enacted in the States and Territories of the coast, from California northward, but, notwithstanding, each succeeding season clearly demonstrates a decrease, which, with the continued enormous canning and packing operations, can not fail in the course of years to so lessen production as to render the maintenance of these industries upon their present gigantic scale impracticable.

In view of what has been presented, there is no such thing as successful disputation of the fact that from the several causes to which reference has been made, and

from the many others that readily suggest themselves, the fish products of American waters have for years been steadily declining. True, there are some that still give evidence of former prolificness, but the number is so small that they are the exceptions that prove the rule. Manifestly, this deplorable state of our fishery interests is due either to the inefficiency or to the non-enforcement of the laws. Nature has had nothing to do with it, except to assert herself when her laws have been infringed. If waters are polluted, the fish she has placed in them either die or seek purer streams. If fish are killed during their spawning seasons, she does not supply others to take their places during that season. These are some of her revenges. Her work is nearly always perfect, and where it fails to be of that character—as far as the maintenance of natural fish-plentifulness is concerned—the failure is the result of man's interference.

It will not be seriously contended by anyone familiar with the subject that the present meagerness of our food-fish supply is due to any legitimate demand for consumption or to any lack of fish-producing waters. The Chinese proper, with a territory not nearly as large as the United States, with a population ten times as dense, with waters that will not compare with ours in extent and variety and which are not in any sense naturally more productive, for centuries before the discovery of America maintained, unimpaired, the fecundity of their rivers, lakes, and seacoasts to an extent that enabled them to make fish their leading article of animal-food diet. That abundance is still maintained. Realizing that the products of their waters must of necessity be their principal source of animal food, instead of—as we have largely done—improvidently “killing the goose that laid the golden eggs,” they have carefully nurtured the valuable boon, and with the results stated.

The anomalous features of the case are that no people on the globe are quicker to appreciate or more ready and eager to take advantage of any and every opportunity for increasing individual or national prosperity than are the Americans, and that so many of them close their eyes to the dollar-and-cent value of what could be realized from the products of our waters. Were those products at this time equal to those of sixty years ago, and were they maintained, as they should and readily could be, by more stringent legislation and by general obedience, the result would be an annual addition of millions to our national wealth, and necessarily and naturally be largely promotive of the comfort of the people. Assuming such to be the case, the question for serious consideration is whether, with any means at command, it is possible to restore the former productiveness? Experience has clearly demonstrated that, save in exceptional cases, merely restrictive laws furnish no adequate remedy for existing evils, nor is it probable they ever will. Fear of punishment is not always an efficient agent in the prevention of crime, but it becomes all-powerful when public opinion stands by as its supporter. Until that sentiment has been inculcated up to the standard of a full comprehension of the intrinsic importance—the money value, if you please—of American fishery resources, there will be little room to hope for ultimate success. That point reached, there will be no need for restrictive statutes. The wisdom of guarding food-fishes against injurious molestation will then come to be regarded as an obligation, the faithful discharge of which will be demanded by self-interest as well as by a patriotic regard for the general weal.

The starting-point in this campaign of education is the thorough dissemination of the truth that all fish in the public waters of a State are the property of the State, and that the taking of them, by whatever means the State may prescribe, is a *privilege*;

that the State's guardianship of its public waters is not intended as a curtailment of individual rights, but an undeniable prerogative to be exercised for the promotion of the public good; and that, therefore, to disregard its commands is practically as much a misdemeanor as would be the illicit appropriation of any other State property. While the fish are the actual property of the people, the people have delegated to their legislative representatives the duty of enacting laws for their protection, the same as though they were public property of any other kind. To insist upon compliance with restrictive fish statutes is therefore no more an infringement of popular rights than is the law requiring that public moneys shall be paid over to the State treasurer, to be disbursed by him only in rigid accordance with legislative enactment.

This may seem an extreme view of the case, but, practically and thoughtfully considered, it will bear no such interpretation. When it is thoroughly impressed upon the public mind, the first and most important step in the direction of restored fish-fruitfulness will have been taken.

Not many years ago insectivorous birds were regarded as nuisances, or at best worthless, except for food. Farmers, in many cases, encouraged their extermination. But when their grain fields were devastated, their fruits destroyed, and their incomes lessened by noxious vermin they began to look around for the cause and a remedy. It was very readily demonstrated that the enormous increase of crop enemies was mainly due to the destruction of the birds. Laws for their protection were demanded and enacted. Bird slaughter ceased, farmers laid aside their shotguns, the idle hunters who traversed the country in every direction, invading private property and indiscriminately killing birds of every kind, were driven away, and respect for the laws was insisted upon. To-day the farmers are receiving their reward in the form of increased crops of grain and fruit. It was the *argumentum ad crumenam*—the appeal to the purse—the potent influence of the almighty dollar, that wrought the change, and such would in all probability be the result if people could be persuaded to believe that duty to themselves and to the State demands obedience to the fishery laws, as well as coöperation with the authorities in the efforts that are made to replenish our waters.

Allusion has already been made to the lax manner in which magistrates, constables, and wardens generally discharge their sworn duties in regard to the fishery laws. It is a fact that will not be disputed that, whether from negligence, indisposition, or the dread of being looked upon as informers, in not one case in a hundred are transgressors of those laws called to account, though the authorities whose duty it is to arrest and punish are fully cognizant of the perpetration of the offenses. A reason for this is found in the largely prevalent opinion, already referred to, that fish in public waters are the rightful property of any one who can take them, at whatever season and by whatever means. Officials who honestly discharge their duties are regarded as informers, and it does not need the saying that the rôle of the informer is a very ungracious one, which private citizens are unwilling to play, however strongly they may be inclined to right a public wrong.

But why should this feeling so generally prevail? There is no such hesitancy in respect to other misdemeanors. The sentiment is erroneous and mischievous. It can not be defended either on moral or legal grounds. A magistrate who, having knowledge of the perpetration of a misdemeanor, fails to bring the perpetrator to justice, rightfully subjects himself to impeachment. Why not in cases of misde-

meanor such as we are considering? It is to this shirking of duty, this evasion of sworn responsibility, that most of the violations of the fish-protective laws are due. Wherever the authorities have faithfully performed their duties the wrongs have ceased.

Take as an illustration the result of determined official action by the State Fishery Commission of Pennsylvania in regard to fish baskets in the upper waters of the Delaware. When official notice was given that all fish baskets in that river must be removed, there was a general expression of indignation, and the declared determination that any and all attempts to remove or destroy them would be resisted with all the means at command. The lives of wardens who performed their duties were imperiled, the legislature and the courts were appealed to, but the commissioners, backed by law and confident that they were simply fulfilling its behests, continued the crusade until eventually they scored a decided victory. Not a fish basket is to be found in that river to-day. Its productiveness has been restored, as already shown, to the extent of making it the finest shad river on the continent. This gratifying result was accomplished by the simple process of a rigid enforcement of law by the State authorities. The benefits to the inhabitants on both sides of the river are so marked that not only has opposition ceased, but many of those who at first were in open antagonism are to-day the warmest advocates of the healthful reform.

This case is referred to for the purpose of showing what can be accomplished by determined official action, and also to emphasize the opinion already expressed that it only requires a practical illustration of the money value of the fishery interests of the country to secure almost universal and cordial coöperation in behalf of fish-protective reform.

Among other efficient agencies that should and can be enlisted in this campaign of education are fish-protective associations. Already a number have been formed and are in active operation. Some of them have been doing notably good work in behalf of fish-protection, having greatly aided the authorities in the creation of a sound, healthy public sentiment. Most of them have largely assisted in the judicious distribution of young fish in waters in their vicinity, and thereafter in protecting them. There can not be too many such associations. There is room for thousands more, and thousands more would doubtless be organized if the young men were fully informed as to their specific object and the great amount of good that would certainly follow energetic action. The effect upon popular sentiment could hardly be overestimated; therefore, all possible encouragement should be given to efforts in behalf of the formation of such associations.

Another powerful auxiliary is the newspaper press. It is not risking much to assert that there is not a newspaper of any repute in the country that will not willingly give the full weight of its influence in behalf of this great work. Such powerful support will not be grudgingly given, nor in stinted quantities. Editors will need no urging. All that will be necessary will be the furnishing of the facts desired to be placed before the people in order to insure their publication, with comments that will add immensely to their cogency. It would be a libel upon the newspaper fraternity of the country to intimate, even, any other course on their part. There is nothing partisan in this proposed campaign. Democrat and Republican, Populist and Prohibitionist, are alike interested in it, and when convinced of its immense importance to the country there will be a joining of hands and concert of action that will be the sure harbingers of success.

Let me, by way of recapitulation, enumerate some of the essentials to success:

- (1) The inculcation, to the extent of a full comprehension, of the truth that the fish in the public waters of a State are the property of that State, and the taking of them, by any means, a privilege.
- (2) That the guardianship of such waters and their finny inhabitants is the sworn duty of the people's representatives, just as is the guardianship of any other kind of public property.
- (3) That the laws enacted in order to make that guardianship effective are binding upon and demand implicit obedience from all.
- (4) That it is the sworn duty of sheriffs, magistrates, constables, and fish wardens, as far as they have cognizance and jurisdiction, to arrest or cause to be arrested and tried, and without fear or favor, any and all offenders against the restrictive statutes.
- (5) That it is a patriotic obligation resting upon all citizens to aid the authorities in their endeavors to restore the original fecundity of American waters, for the reason that such restoration would benefit the country annually to the extent of millions of dollars.
- (6) That it is the duty of the people's representatives in Congress to enact laws that will place the menhaden and other coast fisheries under such restrictions as will prevent the edible fishes from being so largely and wastefully diminished in numbers as they have been for years past, and still are.
- (7) That artificial propagation, judicious distribution, and the thereafter protection of edible fishes should be prosecuted to the fullest needed extent by every State and Territory.
- (8) That fish-protective associations, being potent helpers in the work of restoring edible-fish fruitfulness to our waters, should be warmly encouraged in every State, and the powerful aid of the newspaper press of the entire country evoked in its behalf.

If, after having employed these several means—together with others that will naturally suggest themselves—for the repopulating American waters that have been wholly or in part depopulated, there is not decided increase in their fish products, further efforts may be regarded as a waste of time and money. But such a result should not be deemed probable, nor should even the possibility of it be for a moment entertained.