

MAINE STATE LEGISLATURE

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Public Documents of Maine:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

PUBLIC OFFICERS AND INSTITUTIONS

FOR THE YEAR

1881.

VOLUME I.

AUGUSTA :

SPRAGUE & SON, PRINTERS TO THE STATE.

1881.

REPORT
OF THE
COMMISSIONERS
OF
FISHERIES AND GAME,
OF THE
STATE OF MAINE,
FOR THE YEAR
1880.

AUGUSTA :
SPRAGUE & SON, PRINTERS TO THE STATE.
1880.

REPORT.

His Excellency DANIEL F. DAVIS,
Governor of the State of Maine:

The period has arrived when your Commissioners of Fisheries are required to render their annual account of the trust confided to their care.

The demands made upon our time have been of a most exacting character, while the last Legislature added to the embarrassment of our position by doubling the burden of our charge in constituting us Commissioners of Game, but making no appropriation for administering the *increased* duties of our office. The wide-spread notice of the much needed appointment has precipitated upon us, from all parts of the State, complaints of the infraction of the law, which we are financially unable to send officers to enforce, followed by bitter invectives for our imputed neglect of duty. Without means or resources, but aided by faithful wardens, we have been able to accomplish something, and to summarily punish many of the most flagrant cases. We indulge the conviction that with proper aid from the Legislature we can enforce respect for all our laws, and add so much to the prosperity of our Commonwealth as is now afforded by the attraction of our inland fisheries to anglers throughout the country. We have a firmly established department, and a well organized force of wardens, and if the Legislature makes requisite appropriations, the laws pertaining to fisheries and game will henceforth be as well enforced as those of any other department of the State, and all the work relating to our branch of service will be pushed forward with unremitting vigor.

The result of our year's operations is of a most satisfactory character. We have been enabled to accomplish an unusual amount of important work. Four very large and important fishways have been built on the Penobscot and its tributary branch, the Mattawamkeag river, by which, and some minor improvements between Veazie and Oldtown in the blasting of rocks, the Penobscot is rendered accessible to shad and alewives, and the Mattawamkeag to all migratory fishes as far as Danforth. On the Kennebec two important fishways have been built, one at Augusta and one at Waterville. On the Androscoggin one very important fishway has been built over the lower dam at Brunswick, and such repairs and alterations made on the one above, as we hope will render the Androscoggin accessible to salmon as far as Lisbon Falls. We append a cutting from a Brunswick paper, as showing the value and importance of the work there :

"Several dead salmon have floated ashore above the lower dam. As there is no water running in the fishway of the upper dam, they were probably killed by trying to ascend the upper falls. No salmon have been seen above the falls previously, since the erection of the dam a hundred years since."

Seven hundred thousand (700,000) young shad, presented by U. S. Commissioner Baird, were distributed in the Kennebec and Penobscot rivers. A like number is promised us for 1881. A large number of alewives has been carried by your Commissioners and deposited in Cold Stream pond, at Enfield on the Penobscot, and in Sebago lake, the source of the Presumpscot river. Monstrous schools of young fish have been observed migrating to the ocean from both these sources, to return and add to the food resources of the State.

One half-million of the ova of the white fish of Michigan have been presented us by U. S. Commissioner Baird, our great State benefactor, and will be consigned by us to Rangely waters.

Hermon pond, and its outlet, the Sowadabscook, used, in old times, to be a great nursery of salmon, shad and alewives. We have made the vain attempt, several years past,

to introduce fishways over its several dams, and thus restore to the State some of its former producing value. Causes which we have not here time to dwell upon, have so reduced its volume of water as to render it futile in the future to attempt more than the restoration of the alewives. This, we think, can be done, and to an amount to prove an important interest to both the town of Hampden and the State. We hope, by means of engineering ability, to devise cheap fishways, that will render the Sowasdabscook accessible to alewives, and possibly shad, to Hermon pond.

The Meduxnekeag, emptying into the St. John river at Woodstock, was once a favorite resort of salmon. A protective law was passed by the Maine Legislature, but it was productive of no good result, from the want of a practicable fishway over the dam at the mouth at Woodstock, that the breeding salmon could ascend. The mill that occupied the water privilege at that place has since been burned and rebuilt, and the height of the dam increased. The inhabitants at both Houlton and Woodstock are importunate for a fishway. The Commissioners are ready to restock the river with salmon fry if the Dominion Government will erect a good fishway.

It must always be borne in mind that the Commissioners of Fisheries and Game have no more to do with the sporting side of fish and game, than farmers. Our duties are the production of food. To show that we can plant an acre of water and produce as much food as from an acre of well tilled and cultured wheat. The harvesting of the crop may be sport or work, according to the means, or necessities, or taste of the reaper.

We claim that the establishment of the Department of Fisheries in the State of Maine, has resulted in the largest influx of travel in 1880, that has ever visited the State. For the importance of this travel, its gold bearing results as compared to our mines, and to our other industrial resources, we must refer you to our hotel keepers and our railroad superintendents.

The details of the several features of our department, we shall give under their respective heads.

SALMON.

The run of salmon on the Penobscot for 1879, was of unusual amount. It was estimated to be larger than for many years. We did not anticipate so large a run for 1880, as hitherto it has been the opinion of fishermen that these large runs alternate; but, to our pleasing surprise, the run this year has been larger than in 1879, and what rendered it of enhanced value, was, that it was unusually early in the Spring that the fish commenced returning to our river. This year has been marked as one of very great scarcity of salmon in the Dominion of Canada; those that appeared were at an unusually late period. We hope further experience will sustain our present opinion, that a yearly planting of salmon fry in our rivers, will insure us a reliable and certain annual return, depending, of course, as to its amount, upon the numbers yearly planted. We quote a paragraph from the Bangor Whig and Courier of June 5, 1880:

“Salmon fishers about the mouth of the Penobscot river, report that the catch of that fish this season is something remarkable. The same is true of all varieties of weir fish, of which the fishermen are taking more than has been known at any time for a great many years. Mr. James M. Treat, of Stockton, who has been engaged in this fishery all his life, and whose father before him was engaged in the same business, attributes the great increase to the *artificial propagation of fish*. His privilege embraces the most productive portion of Cape Jellison. Mr. Treat has been a close and intelligent observer of the habits of salmon.”

The large return of salmon to the Mattawamkeag river, where salmon have been shut out for many years, the large numbers appearing in the east branch of the Penobscot, and in the Wassattaquoik, where they had been literally exterminated by both excessive and illegal fishing in the past, has led to so much curiosity, to so many questions as to “why the salmon returns to the river or place where first planted,” etc., that we here give an extract from a paper upon the

"Egg of the Salmon" in Forest and Stream of October 7, 1880:

THE EGG OF THE SALMON.

"The fecundation of the egg is a wonderful phenomenon. The egg in relation to the milt presents one of the most astonishing spectacles, if rightly viewed, which microscopist and "philosopher" can witness. To those of your readers who have not given any attention to this subject, it may be thus briefly described. (For full description *vide* Dr. W. H. Ransom on the ovum of osseous fishes; translation of the Royal Society, London, 1866.)

The egg of the salmon of the size of a pea consists of a semi-transparent spherical mass, whose tough external covering is penetrated by a very minute funnel-shaped opening, termed the micropyle. The milt of the male contains a vast assemblage of exceedingly minute organisms, styled spermatozooids. Perhaps a hundred thousand of these spermatozooids may be equal in bulk to one egg. Taking a minute quantity of milt on the point of a fine needle, and putting it into a drop of water in contact with an egg, the careful observer may witness the following consequences with a good microscope: The number of spermatozooids wandering vigorously round the passive egg, traveling over its surface with considerable activity. Suddenly one reaches the minute funnel-shaped micropyle; it enters, and the mouth of the micropyle contracts. Suddenly, pulsation begins in the egg, a new life has dawned and the micropyle speedily closes. Other spermatozooids continue wandering over its surface, but in fifteen or twenty minutes grow weary, languish, drop off and die. But vivid pulsations continue in the egg, and the new creature is forming. Let us carry the thoughts which may crowd upon us to a further issue. We have had under view two imperfect lives, that of the active spermatozoid and that of the passive egg. But the moment the spermatozoid enters the micropyle a new and a perfect physical life begins, which, as we shall presently see, already possesses absolute knowledge of a special kind, requiring only a short time for its manifestation.

Two of these eggs thus "fertilized" are conveyed far away, say to Australia, and these placed in a river in which salmon had never been. The eggs are hatched, the young fish in due time migrate to a sea of which their ancestors had no experience, and return to a river of which they knew nothing, and where there are no teachings to be gained from the experience of others of their kind. How did they obtain this absolute knowledge of an unknown sea? and whence did they gather the instinct that it was essential they should return to the river in which they were born, at stated periods? Ages of experience in others of their kind were not there to aid them, and migration is said to be the result of experience. It is clear that out of two imperfect lives a new life possessing absolute knowledge—knowledge not gained by experience or teaching—has been produced. Is this to be explained by the formula

of words, that the instinct which impels the resulting creature to migrate to a sea and return to a river of which its ancestors knew nothing is "an inherited habit?" Or is not the gulf between the imperfect lives of the egg and the spermatozoid on the one hand, and the resulting perfect life of the impregnated egg on the other, with its absolute knowledge, infinite to us, passing the power of language to describe, and, failing which, we apply to it a formula of words?

It seems to me that the conception which is so often designated as an "inherited habit," is a manifestation of design, infinite in its variety, endless in its future attainments, and crudely spoken of in the too often misleading language of philosophy by the barren term "evolution," which, properly used and interpreted, indicates only a part of design. The possession of absolute knowledge by the embryonic salmon, and all similar cases, is fatal to the materialistic view of evolution. How the results of experience can be conveyed from the parent to the spermatozoid or to the egg—for habit is derived from the female as well as from the male—we may never fully understand, but that it is an effort infinitely beyond the mere 'potency of matter' we may adoringly believe."

We published in our report of last year, a letter from a friend, commenting upon the fact that while in the past few years the salmon were so reduced in numbers on the east branch of the Penobscot, that netting was entirely abandoned, as producing but two or three fish for the whole season, in 1879 over one hundred salmon were taken on the river at the Hunt Farm. This year, 1880, six hundred and eighty-six salmon were taken at the same place, up to the 15th of July, when all legal fishing ceased.

Considerable enthusiasm and excitement was created among anglers, by salmon rising and being taken by the fly on the Penobscot river and the Wassattaquoik. A great deal of idle theorizing has been indulged in "as to why the Maine salmon would not rise to a fly?" We have taken them at will with a fly, in past seasons, for experimental purposes, at the request of Mr. Atkins, Assistant United States Commissioner, in charge of the salmon breeding works at Bucksport, now moved to Orland. The salmon to be used for spawning were formerly confined in a pond at Bucksport, where they were kept until ripe, when their ova was taken during the months of October and November. The fish there would rise readily to the fly, and were very game. We have taken

as many as eight or ten in one afternoon. Mr. Atkins was experimenting as to whether branding or tagging was the best method of marking the fish for future identity. From Bucksport and Orland, have we obtained our supply of young salmon, with which we have re-stocked the Penobscot and Mattawamkeag, and planted many of our depleted rivers. The salmon, as a rule, does not feed when above tide water. They are there to prepare for breeding. Their feeding above tide water, is the exception and not the rule. Why they will rise, and only to flies of a certain color, is as inexplicable as why certain colors will attract certain animals. The colors that will attract a salmon differ in different waters. How much the motion of the fly in the water has to do with exciting the fish, is problematic. A cat will strike at a feather, or a moving leaf; it is the motion here that excites destructiveness, or the desire to kill. A large stock of salmon in a river is necessary to constitute good fly fishing, for the reason that we have stated, that above tide water they are either on, or on their way to, their breeding grounds, to follow out their instinct of reproduction. Casting over a pool that contains many fish, an observer, from a point where the fish can be seen, will note that but one or two fish will rise, perhaps not one. We have fished on a river that we knew abounded in salmon, and for three days have not had a single rise.

A hotel at the Hunt Farm is already projected, and we anticipate a great rush of anglers next year over the railroads to Mattawamkeag and the east branch of the Penobscot. The west branch of the Penobscot has been full of salmon this year. The gates of the West Twin dam are kept closed, to economize the water, until opened for the passage of the logs of the great west branch drive. The salmon wait below for the opening of these gates, and then seek to make their way to their spawning grounds. This year, after the drives had passed, the gates were again closed by some crews of lawless men, and the salmon wantonly slaughtered. Crews of men sent to remove obstructions on

Ripogenus, and at other places, were guilty of many criminal acts that deserve severe punishment.

The success of salmon restoration by planting is now beyond all cavil an accepted fact, as much as wheat culture or any other food product. We can never again in the future trust to the natural production of our fish fields for our salmon or our trout crops. The fields do not increase in size as do the number of persons to be fed. Improvements have been made by preserving in cans, in refrigerators, in modes of transportation, by which population far removed beyond our sources of production now consume our salmon, to whom it has hitherto been an unattainable luxury. Of all the eggs deposited by natural process on the spawning bed, by the salmon, under the most favorable circumstances, but eight eggs out of every hundred (100) are impregnated by the male fish, and capable of producing a fish. By the artificial process every egg is impregnated, and under the most ordinary care ninety-two (92) out of every one hundred (100) is hatched. Cultivation, a yearly planting of our fish fields with millions of young fry, can only keep pace with the demands, and prevent annihilation of our present stock resources. The unprecedented drought of the year, we feared, at one time endangered our breeding fish. Those in the Mattawamkeag, below Gordon's falls, before the fishway was completed, fell back as the water shallowed, into the deeper waters of the Penobscot. Many at the worst period of the drought were slaughtered in deep pools, where they could not escape; as many as twenty-five (25) were killed in one single pool. We have referred to these cases of crime above. Below the dam at Bangor, as late as the first of October, the fish would come up on every tide and again fall back with the receding water. They seemed to know by instinct that there was not sufficient water above the fishway to enable them to reach their spawning beds.

The want of requisite appropriations, has not enabled us to add any young fry to the Penobscot for the last four years. The two last runs of salmon are of previous planting.

Eighteen hundred and seventy-six was the last planting of salmon by us in the Penobscot river or its triutaries, as we have not had the adequate means to subscribe to the Bucksport Breeding Works for the ova. We have this year been enabled to contribute \$700 to the Bucksport and Orland Salmon Works, for salmon eggs, and \$200 to the Grand Lake Stream establishment, for land-locked salmon eggs for our inland waters, as Moosehead lake, Rangely, &c. For the last two years a very large number of salmon have appeared in the Mattawamkeag, below Gordon's falls to the mouth of the river, where it empties into the Penobscot, a distance of about five miles. We have now opened the river by excellent fishways at Gordon's falls, at Slewgundy, and at Kingman.

Our dividend of salmon eggs, this year, from Orland, is 330,000, to which Prof. Baird has added 250,000, making 580,000. Our dividend of land-locked salmon eggs from Grand Lake stream, is 120,000. We are promised one million young shad for the Kennebec and Penobscot, 500,000 Michigan white fish eggs, (for Rangely,) and 50,000 California trout, (*salmo iridea*). It will be seen that your Commissioners have not only been fully occupied in the past, but have laid out full work for their future.

We require a hatching house for the Penobscot, at either Mattawamkeag, Bancroft or Danforth. The salmon eggs this year will be hatched at Bangor, from necessity, the temperature of the water at Orland being so high that the fish would be ready for distribution before the ice was out of our streams. We have extemporized a hatching house at Bangor, in a store on Broad street, using the Holly water in our fish troughs. For the Kennebec, the salmon eggs will be hatched at the excellent hatching house built for and owned by the Kineo House proprietors.

On the Presumpscot river, where we introduced salmon fry hatched at Norway, and planted in Crooked river, a tributary of Sebago lake, in 1875, we have been expecting a return the last two years. Until this year, we have never

been able to get our chain of fishways on this river completed, so that the fish could get back again to Sebago lake from the ocean. We have a letter from Mr. John Meade, one our most efficient wardens in that part of the State, in which he reports, "Salmon are making their appearance in some of the branches of Rogers' brook, where nothing of the kind has been known. I have not seen them, but believe them to be a return of those turned in five or six years ago; somebody has been operating against them already."

We are informed by intelligent gentlemen, that some of the tributary brooks of Sebago, where many of our salmon were planted, are literally teeming with huge fish of 8 to 12 lbs. If Sebago lake and its tributary waters, of such estimable value to Portland and its railroads, as a great source of summer travel; to its people for its capabilities for the finest angling and sporting resources in the whole country, are to restocked and restored, the unprincipled band of ruffians that infest that region must be broken up and destroyed in the most summary manner. A most capable warden is now engaged in the work, aided by able counsel. These poachers must be stopped in their nefarious work, or we must cease all further operations on those waters. We have 100,000 sea salmon eggs, and 50,000 land-locked salmon eggs, intended for those waters, to be hatched at Norway by Mr. Clarence Smith, at his hatchery.

The St. Croix river is capable of being made one of the finest salmon rivers in the State, but unwise legislation in the past has effectually shut out all improvement. Every general State law that has been passed by our Legislature, has been followed cotemporaneously by an act or resolve exempting the St. Croix river. The St. Croix, unfortunately, is common to both the Dominion of Canada and the State of Maine. The want of co-operative laws has led to its being fished ruthlessly, mercilessly. While the laws of the State of Maine forbid all weir or net fishing for salmon after the 15th of July, on the St. Croix they are allowed to fish through the entire season. Thanks to the appointment by

the Dominion Government, of a most effective fisheries officer, in the person of that worthy gentleman, Mr. Frank Todd of St. Stephen, we can now look forward with hope to a brighter future for the St. Croix. We, in the past, have planted some 75,000 salmon fry in St. Croix waters. We have promised Mr. Todd in the future to hatch and distribute in the waters of the St. Croix, all the salmon ova the Dominion Government will supply. If the Dominion Government will pass a law prohibiting all fishing for salmon after the 15th of July, excepting with single hook and line, or flies, and thus co-operate with our general State law, we can then place the St. Croix river under one law, and increase its value to both governments. Of the result we have no doubt.

Of the Denny's river we have only to remark that if they would display the same energy in the destruction of the Canada thistle and Colorado beetle that they have in annihilating the salmon, and thus depriving themselves of an important local interest, they would render their town and the State a distinguished service.

PROPOSED LEGISLATION.

Our laws are by no means perfect, but we believe more good will result from the certainty of their enforcement than from further "tinkering." It has been a great source of evil in the past that the people, as fast as the fish became scarce from over fishing, or killing on the spawning beds, have sought increased privileges of time and place for fishing. We most earnestly insist that the law as to distance of fishing from any dam, mill-race or fishway, shall not be lessened even one foot under the present State law. No law on that point, however lenient, has ever been obeyed but under the continued vigilance of a faithful warden. As much time and energy has been expended in the endeavor to remove trusty wardens, as in trying to lessen distances and so alter laws as to favor the still greater destruction of our fish. Upon the

preservation of the law forbidding all fishing between the great tide water dams at Bangor and Augusta, and their respective bounds or bridges below, depends the future of the Penobscot and the Kennebec as salmon rivers.

For people to insist upon the same rights of fishing above tide water, as those on tide water, must inevitably lead to extermination of the fish. Tide water fisheries are limited by the tide and navigation; above, it is unlimited to the very sources of the river, where it may be stepped across. The drift net is swept at will, and like the house-wife's skimmer, follows where the cream rises. We would here suggest such an amendment of our laws regulating the taking of salmon throughout the State, that all weir and net fishing should be prohibited from Saturday morning at sunrise until Monday morning at sunrise, and that all weirs shall be constructed with a door of net or board, in the pound, that shall be fastened back and open for the escape of the fish during the prescribed period.

The office or license of taxidermist is more sought for purposes of traffic in the skins of birds and animals, and even for the destruction of game during close time, than the legitimate purposes of scientific study. Our song birds in particular are most eagerly coveted during the mating season, as they are then in their gayest plumage. Birds are as effective against the insect pests that destroy our farmers' fruits and crops, as is Paris Green to the potato beetle. We had occasion this current year to cause the arrest and punishment of the employe of a Massachusetts taxidermist, shooting our birds for trade purposes. His employer escaped the vigilance of our Warden. We hope fewer taxidermists may be licensed, and severe penalties enacted to punish the prostitution of the office to mercenary purposes. It is a less injury to the State to kill a bird or beast for the sale of its skin during close time, than to kill it for the sale of its body for food. Some of our taxidermists are charged with both offenses. We appeal to our farmers to aid us in suppressing this evil.

We can as readily, when the State so wills it, place one hundred salmon or trout where there is now but one, as to increase our product but ten-fold. The same may be promised of our game. It is too valuable an interest to be left at the mercy of a lawless, idle class, without whom, as we have before remarked, the State would be richer and more prosperous.

ALEWIVES.

Probably there is no location in Maine, or in New England, so favorable to a valuable alewife fishery as at *Damariscotta Mills, on the dividing line between the towns of Nobleboro' and Newcastle. The fishery there has been the most important of its kind in Maine for a long time, yet it has been of no great value as a source of revenue to the owners until within the last dozen years, and since the change in the system of management. Even now the greatest possible benefits are not derived from this fishery, owing to the custom of leasing the fishery each year, and for one season only. This serious drawback can be overcome by adopting the custom that has been in practice in Massachusetts, of leasing the fishery for a term of five or ten years. At present the business is carried on in a loose and speculative manner, and necessarily so under the one year lease.

If the "run" of one season is small, and the lessees are losers, the lease is apt to bring a small price the following season. And if, as occurred this year, the "run" is unusually great, it is apt to be followed by a speculative price that results in disaster to lessees, and possibly an eventual loss to the lessors. Until very recently the alewives from Maine have not commanded a market price equal to those from the Canadian provinces. This was owing to unskillful curing. Of course the best results in this respect are obtained where the fish are cured by the same persons year after year, and by whom the requisite skill is acquired by experience. Under the one year system of leasing, all the arrangements

*Damariscotta is an Indian word, signifying "*river of little fishes.*"

and preparations for conducting the business, are of necessity but temporary. Hence it occurred this year, that on the days of the greatest "runs," the lessees were obliged to cease fishing, for lack of means to take care of the fish. Next year, it may not unlikely occur that the preparations will exceed the requirements, and the lessees subjected to a loss from that cause.

The actual value of the fishing depends upon the number of fish caught and the market price to be obtained for them. A market can be found for all the fish Maine can supply, and the price depends more upon the quality of the fish cured than upon the quantity. If the fishing is leased to responsible persons for a term of years, it will give the lessees an opportunity to make suitable preparations, and to establish a business upon a settled basis of a less speculative nature than at present. By thus giving them the opportunity to balance the losses of a bad season by the profits of a successful one, and to establish a market of demand for the fish taken at this place, the future value of the fishing to its owners may be greatly enhanced.

We recommend an adoption of the system of leasing for a term of years, not only at Damariscotta Mills, but at Warren, Waldoborough and elsewhere.

The "run" of alewives at Damariscotta Mills this year was the greatest ever known, exceeding even the great "run" of 1867.

At Warren, on the Georges river, there has been a deplorable decrease in value of the alewife fishery. As this fishery is the property of the town, under a grant from the State giving them exclusive rights and privileges, the control of fishways, etc., it does not come within the especial province of our department; but as in case of Damariscotta Mills and elsewhere, we will offer some suggestions as to improvements, whereby its value may be greatly enhanced.

A great drawback has ever existed here, owing to over-fishing in that portion of the river between the head of the tide and the ocean. As it is a matter that has occupied the

especial attention of the adjacent towns for nearly a century, the remedy can best be determined by them. The incubus of requiring the lessees to supply citizens or inhabitants of the towns with fish at a fixed price, without regard to their actual market value, has, and ever will until abolished, hindered the development of an established business. What would be the result of compelling the users of the water power to supply every inhabitant with a suit of clothes and a pair of shoes at a price fixed by the town?

The decrease of fish frequenting these waters, is due to various causes. Over-fishing must be guarded against, the fishways kept in repair and unobstructed, the young fish returning to the sea given an opportunity to run down (and not be *ground down* in the wheels of the mills), and no fish should be taken at the mouth of the fishway at the lower dam, then somewhat of the former abundance of alewives may be restored.

We wish to call especial attention to the Medomak river (*"river of suckers"*), and the plan adopted by the town of Waldoborough for the restoration and maintainance of the alewife fishery there. The town obtained from the State a grant of the fishery similar to such as had been granted to Warren and other towns. The fishways, of which there are three, have been built and maintained by the town, and the result has been very satisfactory. In equity and justice to all it certainly seems right that such a fishery, local and restricted in its importance and benefits, should be maintained and protected at the expense of the town that derives its benefits. We commend to the towns of Bristol, Pembroke, Surry, and others, the adoption of a similar course.

Cold Lake, at Enfield, has been restocked with alewives this year, for the benefit of Penobscot waters, and Sebago Lake has been stocked with alewives for the first time for the benefit of the Presumpscot river. We are indebted to the superintendents and employees of the railroads over which these fish were taken, for the facilities and assistance afforded in their successful transportation. We

also wish to acknowledge the courtesies of Gen. C. P. Mattocks and N. O. Cram, Esq., in affording facilities for taking alewives alive at the Canal Basin near Portland.

SHAD.

We hope by means of the continued patronage of the U. S. Commission of Fisheries, and appropriations by our Legislatures, to be able to continue in the future the work of stocking our rivers with shad, as well as other anadromous fishes. We have alluded to the receipt of a large number of young shad from Prof. Baird, our U. S. Commissioner, and quote the following from the daily newspapers of June 15, 1880 :

“FISH CULTURE. The cultivation of fish in our inland waters is growing more extensive as the people are becoming better informed upon this subject. Yesterday witnessed an addition to the piscatorial wealth of two of the principal rivers of Maine. On the eastern bound train was a special car of the Pennsylvania Railroad, containing twenty-seven cans or tanks, holding fifteen gallons each, and containing in all 700,000 young fry of the white shad, a salt water fish which breeds in fresh rivers.

These fish were brought from the Havre De Grace Fish Hatching Establishment, on the Susquehanna river, Maryland. They were forwarded to the Fish Commissioners of Maine by T. B. Ferguson, Esq., assistant to Prof. Baird, U. S. Commissioner of Fisheries, and come as a gift to Maine, from the U. S. Department of Fisheries. Six experienced attendants from the Government Works, under the leadership of Mr. H. E. Quinn, were constantly required to attend these fish *en-route*, the whole distance, to keep them alive by aerating the water, icing it to a uniform temperature, so that it will be about the same as the water in our rivers at this season.

The fish were produced entirely by artificial breeding, and were curious looking creatures as we saw them shooting about in the cans. The fry were about half an inch in length, and were from three to four days old. The little fishes are nearly all eyes, with just enough of body to detect the wriggling. A very small per cent. of these shad die *in transitu*. The growth is exceedingly rapid the first few weeks after being placed in the river.

The car left Havre de Grace on Saturday, June 13th, at 4 o'clock P. M., and was intended to reach its final destination, Mattawamkeag, on the Penobscot, Monday night, at 11 P. M. The water in the tanks was removed and aerated every three hours. On Monday noon half of these fish were placed in the Kennebec at Waterville, and the remainder carried to Mattawamkeag, to be deposited in the Penobscot.

It is hoped that all our people may take a new interest in this interesting and fruitful work of restocking our rivers. Good results may be looked for with as much certainty as the careful farmer looks for the waving wheat in autumn, after committing the seed to the generous bosom of mother earth in spring-time."

Every possible facility in the transportation of these shad, and other fish, has been afforded us by the Maine Central, Portland and Rochester, European and North American, Bangor and Piscataquis, Bucksport and Bangor, and Portland and Ogdensburg railroads, and much assistance rendered by the employees. Our work extends over a great territory, and our labors are in no respect light.

The distribution of fish after hatched, is but one of the many items of our work, the details of which require our constant attention, and have grown to proportions but little known to our citizens generally.

After arrival in Maine, these young shad were accompanied by the Commissioners, and planted as above stated. Conveyed from Worcester, Mass., via the Portland & Rochester Railroad, they arrived at Portland by a delayed train, but by the courtesy of Payson Tucker, Esq., the Superintendent of the Maine Central Railroad, the eastern bound train was detained at Woodford's station, where close connection with the Portland and Rochester Railroad is made, and the fish suffered no detention there. One-half the number of cans containing the fish were taken off at Waterville, and emptied into the Kennebec river below the dam at that place.

Having had no time to obtain a dinner, we looked forward to nearly an hour's respite at Bangor for a good supper. But owing to our train being delayed, there was no time except to hastily purchase a lunch to eat on the cars. But by the courtesy of Superintendent Cram of the European & North American Railway, no delay to the fish was suffered, and we arrived at Mattawamkeag at midnight. Here the heavy fifteen gallon cans were carried down a high embankment at the railroad bridge, and carefully emptied into the river. After this labor was completed, we sought shelter

from the frosty night in a car, where we shivered, without sleep, until 3.30 A. M., and then started by train for Bangor. Again were we delayed, and with a sandwich each for breakfast, continued our journey to Augusta, ere halting for the rest and refreshment so much needed.

FISHWAYS.

A practical fishway can be devised for a fall of any height. But no fishway should be ordered for any dam or fall until a careful examination has been made of the stream, its requirements and capabilities, and a survey for the location of each fishway. Then a fishway may be built at each dam, *of such form and capacity as will be suited to the requirements of its respective location.*

There is a prevalent impression that to afford a good and sufficient passage for fish to ascend a river, it is only necessary to adopt the design of some good fishway as a standard, and cause similar one to be constructed at every dam. This error has been a serious stumbling block to the Commissioners of various States in the past. Our dam owners will appreciate the course taken by the Maine Commissioners, in having a special survey and design made for each dam for which a fishway is needed, thereby accomplishing the desired result with the utmost economy; and they can conceive the result should we adopt the course provided by law in Michigan, Virginia, and other States, of ordering fishways built throughout the State of *one specified form.* Not only would thus be incurred unnecessary expense in many cases, but a fishway that is entirely satisfactory in a certain dam, might prove but partially effective, or even utterly useless, at some other dam.

There are now fishways at upwards of forty dams within the State of Maine. During the present year many improvements have been made, and eight new fishways completed at the following named locations: One at each of the three principal dams in the Mattawamkeag, thus opening that river

to the assent of fish for the first time since the erection of the dams. At the dams in the Penobscot river at "Ayers Falls," Orono, and at "Great Works." In the Kennebec river at Augusta, and at Waterville, and at the lower dam of the Androscoggin river at Brunswick. Many fishways have been inspected, and there are repairs needed for some of them. At Warren, on the Georges river, the old fishway at the lower dam is so decayed that it will be necessary to construct a new one at that place.

We wish, in connection with the subject of fishways, to call the attention of the owners and occupants of dams where there are fishways, to a paragraph of section 2, chapter 75, public laws of 1878 :

"It shall also be incumbent on the owner or occupant of the dam to keep the fishways in repair, and open and free from obstruction for the passage of fish, during such times as may be prescribed by law."

There have been fishways in operation in Maine for a great many years, and among the oldest may be mentioned the one at Damariscotta Mills, that has been in operation about seventy-five years. This fishway affords an effective passage for alewives to ascend over a fall of fifty-two feet in height, and is of especial interest, since the lake to which it gives access for the alewives, was not naturally frequented by them, but was stocked by man. Here is a practical example of successful fish culture and an effective fishway, in operation long before any other on this continent outside the State of Maine. And we believe that Maine still maintains the lead in the number and practical success of her fishways, and also in fish culture as applied to the actual restoration of the fisheries.

Penobscot River. At Bangor is the first or lower dam extending across this river. Some improvements to the fishway have been completed here within the year. Owing to about ten feet rise and fall of the tide below the dam here, the fishway was effective but a portion of each day. The improvements were designed to overcome this defect, and an

important feature of the Augusta fishway was added. During the progress of this work at Bangor it was necessary to shut the fishway each day, letting the water in every noon and night after suspension of work. On every such occasion the fishway was examined and the salmon found therein were restored to the river. During the first fourteen closings of the fishway no salmon were found. As the improvements progressed, however, salmon were daily observed, and the numbers found in the fishway at such closing gradually increased from two or three, to seven, nine, and thirteen *at one time*.

At Veazie is the second dam, and the fishway is a passage in the ledge around the end of the dam.

The next or third dam is at "Ayer's falls," between the towns of Orono and Bradley. This dam has been provided with an excellent fishway within the present year.

At "Great Works," between the towns of Oldtown and Bradley, is the fourth dam. A new fishway has been built there within the present year.

The fifth dam, at Oldtown, has a passage for the fish, but it is not always effective, and some improvement is needed here whereby the fish may have a passage at all times. The fish ascending this river have unobstructed access to all tributary streams after passing Oldtown.

Mattawamkeag River. New fishways have been built at the three principal dams in this river. At the first and third dams, "Gordon's falls" and Kingman, the fishways are built upon the new design of the fishway at "Great Works." The fishway at the second dam, "Slewgundy falls," was designed especially for that location. The fall at "Gordon's falls," from crest of dam to surface of water below, is 13 feet, and at "Slewgundy falls" about 10 feet. The total cost of these two fishways was \$3,000.

Presumpscot River. There are now eight fishways upon this river, a new one having been completed at "Wescott's

falls," to allow the fish to pass the dam at the head of the river, the outlet of Sebago lake. So that every dam upon the Presumpscot is provided with a fishway. Some much needed improvements have been made to the fishway at Cumberland Mills, and some improvements are required at the upper dam at the head of the river. This river, although but twenty-two miles in length, has a total fall of 247 feet, and is the outflow of a system of lakes 45 in number, having a combined area of 97 square miles, or about one-sixth of the area of the basin drained. These lakes average over two square miles in surface. Quoting from that valuable work, "Wells' Water Power of Maine," "the water of Sebago lake is shown by analysis to approach as near to absolute purity as any mass of water of large volume in the world." The city of Portland is supplied with water from this lake.

Sebago lake is of especial interest in regard to fish. Salmon, and smelts of the common species that frequent the Maine coast, being constant residents therein. The only member of the cod family (*Gadidae*) known in our fresh waters, the cusk or ling, also abounds there. The principal resort of the salmon and trout for breeding purposes is Crooked river, tributary to Sebago lake. This river is about 42 miles in length, but only a portion is now accessible to fish ascending from the lake. A fishway at "Edes Falls" would greatly extend the accessible spawning grounds of these fish.

St. Croix River. There are four fishways in this river, and one at Princeton, on its tributary stream, the outlet of Big lake, Grand lake, etc.

Androscoggin River. There are two fishways upon this river, at the dams between Brunswick and Topsham, a new one, designed two years ago by Charles G. Atkins, Esq., of Bucksport, having been completed this year at the lower dam, and salmon are known to have passed through it. The fishway at the second dam has been enlarged, and with a little improvement at its outlet will be as efficient as it will be

durable. This is a fine fishway, constructed upon a ledge, and is entirely of stone.

Kennebec River. Two fine fishways have been built here within the present year. The fishway at Waterville, built upon a design furnished two years since by Chas. G. Atkins, Esq., was completed at too late a date for its merits to be practically tested this season. But it has been inspected by the Commissioners, and we regard it as one of the finest in the State. The structure is of an extensive and permanent nature, and no expense has been spared by the builders in its construction. A fall of about eight feet is overcome by this fishway. Its total cost approximates \$8,000.

As the subject of a fishway at the Augusta dam, the key to the Kennebec river as regards the restoration of its salmon fishery, has been before the public for many years, it may be appropriate to give its history, and this we cannot better do than by quoting from the very comprehensive letter of G. W. Martin, M. D., published in the *Kennebec Journal* of May 5, 1880, and the report of the formal opening of this fishway, as published in the same *Journal*, May 26, 1880 :

THE NEW FISHWAY.

"It has been more than forty-five years that the Kennebec river, above Augusta, has been closed to migratory fishes. The "oldest inhabitant" can distinctly remember the great annual run of fishes during the spring and summer, when they were on their journey far up the stream to their old spawning ground.

What the Dam did. A dam was built across the Kennebec at Augusta in 1834, which effectually stopped the migratory fish (salmon, shad and alewives) from passing it. Since which time only a few of these valuable food fish have been seen above the dam; and these found their way through the lock when it was open for the passage of boats and rafts of lumber. Previous to this time the Kennebec was a splendid river for fish, and afforded the inhabitants along its banks and tributaries an abundant supply of food. The writer's grandfather and other early settlers of Pittsfield, on the Sebesticook, have said to me that they would build a weir across the stream and in one day and night would catch enough fish to pickle, smoke and dry, to last a year—besides catching enough in a few minutes at any time during the run to supply them with fresh fish. But now, our migratory fish in the Kennebec are nearly extinct, (with the exception of eels.) To be sure, fish come up the Kennebec and turn into Merrymeeting bay, and some go up the Androscoggin, but few come up as far as Augusta. The shad find suitable spawning grounds in Merrymeeting bay and continue to be plenty there. Salmon are very scarce. The reason of this is, because they cannot find spawning grounds. It is an established law in Ichthyology that migratory fish return, if possible,

to the place where they were hatched, to deposit their ova; failing to reach their old spawning grounds they exhaust themselves in trying to reach it, or fall an easy victim to the spear and net of the fisherman, and in the course of time become extinct. However, it is possible that some fish which were hatched out above the dam 46 years ago, may now be living and have come annually to this place, demanding a free passage up river. But it is very doubtful even if fish live to that age, (fishes and animals that live in the water, it is said, attain to a great age. Common brook trout have been confined in a well thirty and even fifty years. A pickerel has been known to live in a pond ninety years), that any of our Kennebec salmon, shad or alewives, should have escaped the wiles of the fishermen for so long a time.

The First Fishway. After many years of effort, a suitable passage has been made through the dam at this place, but our fish are gone, and we must begin new. It was especially provided by an act of the Legislature, March 7, 1824, granting a charter to the Kennebec Dam Company, that "It shall be the duty of said corporation to construct and maintain from the 20th of April to the 20th of July, in each year, a good and sufficient passage-way in, through or over said dam, and at the most suitable part of the same, so as to render the passage of salmon, shad and alewives, practicable and easy, so that the same may go up the said river into the fresh water ponds, streams and other waters connected with the Kennebec river above said dam." Notwithstanding this plain provision for a fishway in the charter of the corporation, it was several years before an attempt was made to build a fishway; and then only a frail and unsuitable structure was made, which was carried away by the first freshet.

In 1867, a Commission of Fisheries was established by the Legislature, and authorized to restore sea-fish to the rivers and inland waters of Maine, and Charles G. Atkins of this city, and N. W. Foster, were appointed commissioners. They made great exertions to have a fishway built over the Augusta dam, but failed to compel the owners to do so. In 1878, the Kennebec Association for the Protection of Fish and Game commenced to agitate the fishway question in earnest, and after reciting the law and history, "resolved, that the Association respectfully and earnestly request the Fish Commissioners of the State of Maine, to immediately take measures to procure the building of a suitable fishway over the Kennebec dam at Augusta; and that the Association pledges itself to use every legitimate means in its power to aid in the speedy building of said fishway."

The Fish Commissioners. Mr. Fish Commissioner Stilwell took active and vigorous measures to carry out the request of the Association. He employed Charles G. Atkins and Everett Smith, as engineers to make the plan, and a fishway was located at the west end of the dam. The fishway is constructed on scientific principles, and is one of the best in the world. Great credit is due Messrs. Stilwell and Smith for the *energetic* and *intelligent* manner in which they have accomplished this great undertaking. I have no doubt of the success of this enterprise. Salmon, shad, alewives and lampreys, that are hatched above, will easily find their way through it and go up to their spawning grounds, and we shall see them plenty in the Kennebec river. I sometimes hear doubts expressed as to fish finding their way through such a crooked passage as our fishway. It should be remembered that migratory fish find their way up stream against the current, no matter how crooked or tortuous it may be, with as true and unerring an instinct as the robins and swallows find their way back from the south, where they go to spend the winter, and return to occupy their old nests in our barns and garden trees. The *current* is the guideboard that directs fish on their way, their way is *up stream* to the place where they were hatched. They rarely go above this point.

How the Kennebec is to be restocked. The instinct which induces fish to seek their native stream for the purpose of spawning will be turned to good account in restocking the Kennebec. Salmon eggs will be secured and carried to Moosehead lake, where a hatching house is built, hatched

out, and the young fry put in the streams on the old spawning grounds. These young fish will go to the sea to get their growth. In the course of four or five years, with unerring instinct, they will return full-grown salmon, to the very place where they were born, to deposit their eggs. Shad eggs will be secured and hatched and the young fry put in their old haunts. A sufficient number of alewives can be caught not far below the dam, and transported up river. It is believed they will find suitable spawning ground, and restock the upper waters.

Messrs. Stilwell and Smith, our intelligent and competent Fish Commissioners, have made ample arrangements to fully restock the Kennebec with migratory fish. We may expect to begin to reap the benefits of their well directed efforts in from five to eight years. It requires time and patience to restock a river.

The Savory Lamprey. There is another migratory fish which comes yearly up the Kennebec, deserving of mention, the lamprey, whose flesh is considered a great delicacy. The love borne them by the ancient Romans is a matter of classical history, and at the present day they are the favorite food of epicures. There is a ready demand for them in Boston and New York. They made their way up the river until within a few years, in spite of the dam here, and were an important food supply to many families. On February 25, 1869, an ice freshet carried away the Augusta dam, and it was rebuilt three feet higher, since which time they have been unable to go above this place. They will now find an easy passage through the fishway, and will soon be plenty up river. This will probably be the first fruits of the enterprise.

The Irrepressible Eel. The only fish that has been able to surmount every barrier the ingenuity of men has put in the Kennebec to stop the migratory fishes, is the silver or common eel. It is said they spawn in salt or brackish water, and that their migration to fresh water streams commences at an early period of their existence. It would seem more reasonable to believe that they are no exception to our other migratory fishes, but ascend our rivers for the purpose of depositing their spawn in fresh water. The autumnal journey of the eel towards the sea begins in September. It is at this period so many of them are caught in eel-pots and eel-weirs. There is a prejudice against them by some people on account of their reptilian form; yet they are excellent eating. This is also a classical fish. Caesar is said to have distributed 6,000 of these fishes among his friends on the celebration of one of his triumphs. It is reserved for the far superior fish, in beauty of form and delicacy of flavor—the lordly salmon—to grace the triumphs of modern civilization, and furnish a food fit for the gods.

Salmon, alewives, lampreys and silver eels find but little trouble in making their way through a well-constructed fishway; but it has not been so clearly proven in regard to shad. There is doubt whether they will go through such an artificial structure.

The Augusta Fishway. Messrs. C. G. Atkins, and Everett Smith, Civil Engineer, met at Augusta July 23, 1879, at request of the Commissioners of Fisheries, and determined upon the form and site of a fishway adapted to the requirements of the location. August 19, 1878, the corporation owning the dam was served with plans and specifications, and notice to build in accordance therewith, by the Commissioners of Fisheries. No steps were taken by the corporation, however, toward building the fishway, either in 1878 or 1879. In February, 1880, said corporation presented to the Legislature a petition, stating that said plans required an expensive and complicated structure, and one that would endanger the safety of the dam, and asking to be relieved of the requirement to build it. An engineer was then employed as an expert to examine the dam and fishway plans. The petition was then withdrawn, and an agreement made on behalf of the corporation to build the fishway in accordance with said plans and specifications, as nothing better could be offered in substitution, nor any modifications suggested.

In consideration of being relieved from penalties incurred for not having previously built the fishway, an agreement was made to build and complete it previous to May 15, 1880. The work was immediately begun, and has been most energetically carried forward by Capt. N. W. Cole. In spite of the difficulties and delays in putting in the foundations at this season of the year, the fishway was completed before the expiration of the specified time. The heavy work of building the pier and laying the foundations, has been in charge of Mr. T. J. Emery of Waterville, and the framing of the fishway in charge of Mr. J. M. Murch of Augusta. The whole work has been done under the direction of Mr. Everett Smith of Portland.

The protecting pier was first completed, and had its first test during the freshet of April 5th, when there was seven feet of water flowing over the dam. It was then seen that the pier accomplished just what had been designed by Mr. Smith. The great eddy formerly existing below the west end of the dam, in which logs and ice collected and did much damage, was so cut off as to be rendered inappreciable. Besides protecting the fishway from destruction by the immense freshets to which the Kennebec river is subject, this pier affords protection for the wharf and saw mill below the dam.

The fishway has been built under the personal supervision of Everett Smith, Civil Engineer, of Portland, Maine, and several important changes and improvements made in the original plan, whereby a large saving in cost has been effected, as well as rendering the fishway more efficient. Mr. Smith regards one improvement especially as an innovation in regard to fishways that is of great value, and one applicable to any form of fishway or any dam. The fall of the Augusta dam is about eighteen feet, and as this is the first or lower dam, it forms the key to the Kennebec river, as regards the ascent of fish.

From the west end of the dam, a massive crib pier extends downstream, and the space between this pier and the canal wall is filled by the fishway, which is about the shape of a diamond in its general exterior form. The head of this protecting pier has an elevation of twelve feet above the dam, to insure safety to the fishway, from logs or ice during the great freshets to which the Kennebec river is subject. The water for the fishway flows from the river above the dam, by a passage through the head of this pier. This passage may be closed by a drop-gate; there is a waste-way across the pier, and still farther along is the flume, from which the water is delivered directly to the upper portion of the fishway by means of gate-ways occupied by iron swing-gates. These gates are so arranged that when one is submerged it may be closed and the next higher one opened. Thus the water may always be delivered gently without any "head." The fishway is three stories high, and the interior divided into a series of chambers, through which the water flows in a uniform descent, twice making the entire circuit of the structure, which it finally leaves at the outlet. In making a descent of 18 feet the water flows an extreme distance of 594 feet, although, as measured by the centre of the current, the distance is considerably less. The floors are paved with stone, which serves to load the structure, to retard the current of the water flowing over it, and to present to the fish a bottom resembling the natural bed of a stream.

At the lower end of the flume there is a waste-way, and the water flowing from it unites with that flowing through the fishway at its outlet. The volume of water is thus increased at the outlet, in order to attract fish to enter the fishway. The fish, after entering the fishway at its outlet, will ascend the current that flows therein, until the flume is reached, whence they pass to the river above." M.

THE FISHWAY OPENED.

Notwithstanding the hot sun which poured down upon the devoted heads of the spectators, some five hundred persons assembled at the dam to witness the formal raising of the gates and the opening of the fishway. Teams were hitched for a quarter of a mile by the side of fences. The landing and way were covered with a crowd of persons. Among the distinguished visitors were His Excellency, Governor Davis, and Council; His Honor, Mayor Vickery; W. H. Venning, Esq., Fish Inspector for New Brunswick; General Cook of Rhode Island; ex-Senator Lot M. Morrill, Col. A. W. Wildes, Railroad Commissioner; Mayor J. R. Bodwell of Hallowell; ex-Mayor Charles E. Nash, County Attorney Heath, Fish Commissioners Stilwell and Smith, Dr. Martin, Col. Darius Alden, Thomas Lambard, W. R. Smith, and many other prominent citizens of Augusta and other cities and towns. H. K. Morrell, of the Gardiner Journal, stood in the throng, with his head protected from the fierce rays of the sun by a cotton umbrella. Mayor Vickery was introduced as the first speaker, and made the following remarks:

MAYOR VICKERY'S SPEECH.

Fellow Citizens:—I thank you for the honor which you have conferred upon me by selecting me to preside over your deliberations here to-day; and I congratulate you upon the success which has attended the scheme of successfully building a fishway here at the Kennebec dam, in this city. For many years it has been contended that a fishway could not be constructed here without detriment to the stability of the dam; but thanks to the skill of Hon. Everett Smith, as civil engineer, and the untiring energy and zeal of our Fish Commissioners, all obstacles have been overcome, and we have before us here to-day, a structure that is not only efficient for the purposes for which it was built, but adds to the security of the dam itself instead of weakening it. The benefits which will arise from this enterprise will be far-reaching in its results, it will not be confined to Augusta, the Kennebec valley, nor even to this State. It is not my purpose to enter into the history of the Kennebec fisheries at this time, or to make any extended remarks, but will leave that to abler tongues than mine.

GOVERNOR DAVIS spoke as follows:

Mr. Chairman and Gentlemen. Fellow-Citizens:—I am very glad to meet you on this occasion, but shall not weary your patience with a speech. You did not come here to listen to long speeches, but to mark the completion of an event of great interest to the people of the Kennebec valley and the State of Maine.

I wish to speak in a general way in regard to the fisheries of Maine. A few years ago our people did not think it possible that the depleted streams of the State could be restocked with fish. Many thought that the great manufactories on the river had poisoned the waters, and the floating sawdust choked the gills of the finny tribe. People were not interested in the subject; it was with great difficulty that laws could be obtained for the protection of the migratory fish. Our citizens looked upon it as a mere experiment of science. It was not. The efforts of the Fish Commissioners have been crowned with success. To-day, through their efforts, the Penobscot, my own river, teems with delicious salmon, and is one of the best salmon rivers on the Atlantic coast.

To-day you meet to open a fishway—one of a series. It may seem a small event to you; but it is one of great and far-reaching importance—the opening of another industry for the Kennebec valley. You boast of your great industries in ice, of your lumber trade, of your magnificent granite quarries, of your shipbuilding; but we meet to-day to commemo-

rate the opening of another industry. We have in Maine 2,000,000 acres of water surface, 3,000 square miles, above sea level. Our crystal lakes and ponds should be stocked with fish, and made to produce even more than in a state of nature. We are beginning to understand the phrase, "fish farming." We are beginning to learn that it is possible, by artificial process, to produce almost ten times as many fish from eggs in hatching houses as incubate in the streams. Soon these waters will teem with as good fish as there are in the world. It is the duty of the State, and every citizen in it, to protect and foster this industry.

I don't believe that it is necessary for young men to leave Maine in order to win success in life. We have a multiplicity of industries; we have shipbuilding, lumber, commerce, ice, granite, and mineral wealth. We are soon to add another industry upon the inland waters and upon the coast, so that our young men need not go out of the State in order to make an honest living and amass a competency.

At the conclusion of the Governor's address, Fish Commissioner Stillwell stepped up to General Cook, and said: "We now accept the fishway." The workmen applied levers to the gates, and in a moment a flood of water was pouring from chamber to chamber and the fishway was formally opened."

The height of the Augusta dam is about eighteen feet above the *surface* of the water below. The total cost of the protecting pier, of preparing the foundation, and the fishway itself, was \$9,400. Less than one-half of this sum was expended upon the structure that forms the fishway proper.

Upon examining this fishway a few hours after it had been opened, seven species of fish were found at various points therein. There were lampreys, white perch, bream, chubs, yellow perch, suckers, and alewives. It was gratifying, in view of the various opinions expressed concerning this fishway during its construction and before, to know that all these fish found and used the fishway *immediately* after it was opened to them. The fishway was examined at various times during the month of June, and on every occasion there were various sorts of fish observed therein, including alewives, lampreys and perch. Although but few salmon have come to the dam at Augusta in recent years, yet those few passed the dam, through the fishway, this year. Several instances of salmon seen at the outlet of the fishway were reported to the Commissioners, and, in July, salmon and alewives were seen below the dam at Waterville, eighteen miles above Augusta. Several fine salmon were taken at Waterville, and the first one was placed on exhibition there, attracting attention as the first result of the Augusta fishway, and as the

first salmon taken from the Kennebec river at Waterville since many years. The people of the Kennebec valley should extend a fostering care over these fish, and lend their aid to the enforcement of our laws for protection.

Although, in this branch of our work (fishways,) as well as in all other branches of the department, more has been accomplished than ever before, yet the demands upon us by the public are greater than ever before, and we have been unable to respond as might have been desired in all instances.

In the introduction to this subject, allusion is made to the preliminary work necessary ere a fishway is constructed. A more full explanation may give the public a better comprehension of our duties to be performed in connection therewith. First, the Commissioners should carefully examine the nature of the river, and lakes and streams tributary to it, ascertain what varieties of fish frequented it in the past, what fish now frequent it, to what fish it is now best adapted, the nature and extent of breeding places that may be made accessible to anadromous fishes, etc. Then each and every dam or obstruction in the river, commencing at its mouth, must be thoroughly examined, the location of fishways therefor determined upon, and a survey made at each dam, to furnish data towards designing such a fishway for each dam as will best be adapted to its location. In designing such fishways, the subject of hydraulics and engineering construction must be studied, as well as the habits of the fishes for which the structure is designed. A practical knowledge of the river at various seasons of the year, must be acquired, in order to ascertain the dangers to which the fishways may be exposed, and that suitable protection therefrom may be provided.

It might truly be regarded as entirely too zealous, should the Commissioners order fishways at every dam in the State. We deem it highly essential that all these preliminary investigations should be observed, and that the voice of the public should be our incentive to action in such cases. In many instances the building of fishways is a heavy burden to the

dam owners, and when these burdens must be imposed for the public welfare, it is but just that the Commissioners, as executive officers, should take every precaution to render the burden as light as possible, consistently with the accomplishment of the desired result.

After all preliminary investigations, if it is determined that a fishway shall be constructed at a dam, the owners and occupants of that dam are notified to meet the Commissioners, and the location of the fishway is then finally determined upon. Then, after the form of the fishway has been designed or fixed upon, plans and specifications thereof must be legally served upon the dam owners. Then the dam owners have twenty days' right of appeal to the County Commissioners. After the elapse of the time specified for its construction, if the fishway is not completed the dam owners become liable to heavy penalties, and legal proceedings can then be entered into whereby the court may compel them to observe the provisions of the law.

In this connection we wish to call public attention to, and to recommend for application to such small fisheries as are of importance only to their immediate localities, the system that has been adopted at Waldoborough. The State granted the exclusive right of the fishery of the Medomak river to this town, wherein it is located. The town has built three fishways from its own funds appropriated for the purpose, the alewives have been restored to the stream and given access to their breeding lakes, and next spring the fishery will probably be leased to private parties, who may be the highest bidders therefor. The town provides for the maintenance and care of the fishways, the protection of the stream, and of the lessees in their purchased rights, and will reap whatever benefit may be derived therefrom.

In conclusion we would ask the indulgence of those who have made demands upon us within the past year if we have failed to meet the requirement of all, and we beg to call your attention to the immense territory under our jurisdiction, and the multifarious duties that demand our time and energies, in

conjunction with the fact that never in Maine, nor in any State of the Union or province of Canada, has been equaled, in any one year, the work accomplished by our department in all its branches within the year past.

GAME.

All game (*Feræ naturæ*) is the property of the State within which it exists. And no person has a legal right to pursue or take it, except by the means and at such time as may be permitted by the laws of the State thereunto pertaining.

By an act of the Legislature, approved March 9, 1880, it became the duty of this department to enforce the game laws, as well as the laws relating to our fisheries.

Although no appropriation of funds to be applied to the enforcement of the game laws had been made,* we took such steps as were possible to bring offenders to justice. An offence committed on March 12th, only three days after the act referred to became a law, we successfully prosecuted, as our first case. This cost the offenders \$71.00 for their amusement, if it pleases them to regard as sport the running down a gravid doe in the snow, and butchering it when exhausted.

The list of prosecutions will show that we have made energetic efforts in the discharge of our new additional duties, and we hope to receive the support and assistance of our citizens and sportsmen in the continuance of this work each year. Our citizens are awakening from their apathy in regard to our fish and game laws, and the general desire for a vigorous enforcement of them, calls forth the support and assistance needed, and without which we can do but little.

GROUSE.

We wish to call attention to the work of extermination, practiced by parties engaged in snaring grouse or "partridges." Very few of our citizens are aware of the extent to which snaring is practiced, and, although the grouse are nearly exterminated by this means in some districts, the

*The appropriation of 1880 was for the "propagation of fish."

public are at a loss for a cause to which it may be ascribed. The practice is carried on so secretly that it is often known only to those engaged in it, and perhaps those to whom the birds are sold. It often happens that many broods of grouse are observed in some locality during the Summer, but when sought for in the mellow days of October, but few, if any, can be found. Since Summer woodcock shooting has been prohibited by law, the grouse have increased in numbers. When it was legal to shoot woodcock in July and August, the young grouse were slaughtered in great numbers before September 1st; every one found in the woods with a gun and dog being *ostensibly* there for woodcock. Fortunately for the preservation of the grouse, no woodland game can now be legally killed before September 1st, and he who goes to the woods with gun and dog in July and August, becomes an object of suspicion, while the sound of a gun is *prima facie* evidence of a violation of the law. We warn sportsmen, who may take young dogs out for training, to leave the gun at home, if before September 1st, lest they incur the odium, at least of being suspected, of poaching.

WOODCOCK AND SNIPE.

Although the Spring was very favorable to the breeding of woodcock, the almost unprecedented drought that extended well into the Autumn, and past the usual rainy season of September, rendered the earth so parched and dry, that the customary resorts of these birds yielded no food, and they were thus driven to seek other feeding places. Usually the woodcock remain throughout the Summer in the vicinity of their breeding places, and, after moulting, collect in the coverts that are their favorite resorts. But this year these coverts have comparatively been almost deserted, the birds having scattered over the country, along the banks of streams and shores of lakes, the edges of meadows, and places where they have not been observed before. Reports from Canada show that woodcock were exceedingly abundant in the

Autumn, and places that usually have afforded but little shooting, seem to have been thronged with birds. This has been true, also, of snipe, which were scarce in Maine from the same causes that occasioned the scarcity of woodcock; the meadows and marshes being very dry at the time of the usual appearance of the snipe during the Autumn.

As is usual after a poor season, many of our sportsmen discuss the advisability of restoring the old law, permitting woodcock shooting in Summer. We trust that this will never be done, for it would open the door to a slaughter of young grouse, and, most certainly, four months' shooting at woodcock, instead of two months, will not serve to increase their numbers.

Since Maine abolished Summer shooting, other States have done likewise, and with good results; and we hope that all other States will follow the example.

It is true, that ten years ago, one could show more birds as the result of a day's shooting in Maine; but there are now ten or twenty times as many persons hunting woodcock as then, and all the best coverts are hunted through almost daily during the whole season. Hence the birds are not suffered to collect in numbers, but the *aggregate* number killed each year far exceeds that of the years before Summer shooting was prohibited.

DUCKS.

It will be remembered that within ten years the ducks that frequent our lakes and streams gradually became scarce, and even exterminated in some localities where previously accustomed to breed. This scarcity was owing to extensive *netting*, but the perpetrators were driven off for a time, and the ducks increased, until regaining their former abundance last year.

It has recently come to our knowledge that the same causes of extermination have been in operation this year, and we call especial attention to the fact. We intend to publish in the

future the names of those who persistently violate the fishery or game laws, and we now brand as a professional poacher and persistent violator of our laws, *Daniel Y. McFarland of Lamoine, Me.* This man, with his associates, has been engaged in the business of *netting ducks* for many years, and we not only call upon all good citizens to aid in forcing him to abandon this illegal pursuit, but warn the citizens and officers of the law in other States, and our Canadian neighbors, that the operations of this man are not confined to Maine alone. He is the leader of a gang of poachers whose operations a few years since bid fair to exterminate all the wood ducks and "black ducks" that bred in the State, and he has been operating again upon an extensive scale in Maine within the present year. He is wanted in Maine to meet the justice that awaits him, and the heavy penalties that he and his associates have incurred.

QUAILS.

It is quite generally known that a large number of quails were imported from Europe this year, and liberated at various places in the United States and Canada. More than one-half of the total number were distributed in Maine. These birds were purchased by private subscriptions, but as they have now come under the protection of our department we give this mention of them, which may prove of interest to our farmers and sportsmen.

This quail (*Coturnix communis*) is the common migratory quail of Europe, that for centuries has crossed the Mediterranean sea from its Winter home in Africa to its breeding places throughout Europe, returning again to Africa in the Autumn. The bird resembles in outward appearance our American partridge (*Ortyx Virginianus*) that is termed "quail" in New England. The migratory quail is one-third smaller, and the throat of the male bird is marked with dark brown or black, that extends from the bill downwards. The note of the quail may be expressed, as nearly as is possible

to translate into words or syllables, by "*who-eat—wheat—wheat*," the preliminary crescendo "*who*" not being heard at a great distance, but the three clear notes may be heard a quarter mile away. Often the notes seem to come from a bird near by, but really afar off, and perhaps in another field not near the listener.

The quail is strictly a terrestrial bird, and inhabits the fields, where it also nests. Fifteen eggs to a nest is not an unusual number, and as each egg, laid by a bird of but three or four ounces weight, is as large as the egg of our robin, we have been frequently asked how so small a bird manages to hover and hatch so many eggs in one nest.

The nest is a depression hollowed in the ground, and lined with grass by the bird. In this nest are laid the eggs in regular order, upon the bottom and around the sides of the nest, the upper ones supported by the eggs beneath and the sides of the shallow, bowl-like nest. While setting, the body of the bird is surrounded upon breast and sides by the eggs, while its wings are raised to cover the top layer of eggs upon each side. Many nests of fifteen eggs each have been reported as found, and all the eggs were hatched.

One nest of eighteen eggs deserves especial mention, as of interest to students of ornithology. The eggs in this nest were laid in tiers or layers most carefully and compactly arranged, one above the other, as if placed by the hand of man, the bottom layer most entirely hid from view by the eggs above. But twelve of these eggs were hatched, and evidently the bird was too ambitious. Probably the bottom eggs were so covered by others that not sufficient warmth was imparted to them from the body of the bird.

The eggs of the quail are of a greenish color, profusely blotched with brown. Alike other eggs, if deserted and left exposed to the sunlight for days, the color will fade until it becomes almost white. This year the eggs were laid in June and hatched in July. The young birds leave the nest as soon as hatched, and mature very rapidly, being strong of wing in September.

Among the noteworthy characteristics of the quail are its gentleness, and the extreme pertinacy with which it adheres to its domestic duties. We found two nests with eggs within a few rods of a farmhouse, where a lot of the birds had been liberated, and close by a travelled highway, as well as near a railroad. The birds were occasionally observed among the chickens about the house.

Quite a number of quails have been killed by mowing machines. One might naturally suppose that the clatter of one of these machines approaching would sufficiently alarm any bird, even while setting upon its eggs, to cause it to leave its nest temporarily. But some have had their heads cut off by the knives, and in one instance the machine was a typical "Juggernaut," the wheel passing over and completely crushing the quail and its eggs in the nest beneath it.

The quails have a strong scent, readily detected by setters and pointers, but they often seek to escape by concealment, or without taking flight. They are fast runners, and in a field trial on these birds under the present system of awards and demerits, the dogs possessed of the finest "nose," or scenting powers, would be handicapped, and receive a score of demerits for "false points," as it would not infrequently occur that the bird, or birds, would not be flushed before the dog, although there when the point was first made.

Some young quails were captured near St. John, N. B., this year, although none were liberated nearer than at St. Stephen. Several quails were heard and seen near Machias throughout the Summer and Autumn. None had been liberated nearer than the Penobscot valley on the west, and at Calais, forty miles to the east. This is not remarkable, however, in consideration of the fact that a quail can easily fly fifty miles within an hour. Unlike our American partridge, or "quail," it is capable of long sustained flights, without stopping to rest.

We annex clippings from various newspapers, relative to the quails :

"A batch of two hundred migratory quail released by me in the town of Wareham, Mass., last summer, mated, nested, reared their young, were seen occasionally through the summer, and have now left, presumably for the South. Evidently they take kindly to our climate, and evidently also their instincts will preserve them from the heavy snows and severe cold of our Winter, which prove so fatal to our native quail. This part of the problem having been solved, I am now awaiting with interest the solution of the remaining branch, namely, will they return next Spring to the spots at which they were released?"

There would appear to be odds of ten thousand to one that the birds, flying down the length of our Continent, spending the entire Winter in the South, and spreading over thousands of miles perhaps in their ramblings there, would not return to this same State; and still more to a particular county in this State, to a particular town in that county, and finally to a particular wood-lot, brook and meadow in that town. Yet the evidence is fast accumulating to prove that they will do so. Here is the latest instance:

In the town of North Falmouth, on Cape Cod in this State, is a long, wooded peninsular, known as Nye's Point, and owned by Mr. Downer. In the summer of 1878, Mr. Downer released upon this point a batch of migratory quail. In time they bred, raised their young and disappeared. In the late fall of last year not one was to be found upon the point. In the early part of November of this year two large flocks of migratory quail were found upon that same wooded point from which they had taken their flight the preceding year. How many more could have been found by searching is unknown, as it was not desirable to disturb or harass the birds. Presumably the two covies accidentally walked up were but a small portion of the birds that had returned to take possession of their old quarters. Such instances are very encouraging for those Northern and Western sportsmen who are interested in the introduction into this country of a rapidly breeding, thoroughly game bird, adapted to furnishing abundant sport, and able to protect itself by its migrations from the deadly winters of the North and West."

HORACE P. TOBEY.

December 15, 1879.

"I am happy to say that the migratory quail imported by our club a year ago last Spring returned and hatched in this vicinity in considerable numbers this season. They stayed with us later this season than last, as indeed our woodcock and native song birds did. I saw a covey myself the last week of September, consisting of about ten or a dozen well-grown birds; and I heard of a covey of about twenty late in October, working on buckwheat stubble. Last season I think they all left some time before October 1st. I feel satisfied that they will prove a valuable addition to our list of game birds, especially in the North, where Bob White is winter-killed to as great an extent as with us; and also I am satisfied that they will be an early bird to shoot, and will be in season by September 1st in this locality. They must grow with marvelous rapidity, as I have not heard of their arriving here before May 1st, and all that I have seen in August so far seemed to be full grown. We have not killed any here yet, preferring to have them get well settled first."

W. H. WILLIAMS.

LAKEVILLE, CONN., Dec. 15, 1879.

QUAILS FOR MAINE.

"A general movement is being made to introduce to the fauna of Maine the Quail, (*Coturnix communis*.) of Europe. This fine game bird is probably the same species that furnished food to the Israelites after their long march. It is a migratory bird, breeding in the North, and spending the Winters in the South, and this habit renders it suited to the latitude of Maine. It lives on the ground and in fields, and its Summer food consists

largely of insects. First imported to America three years ago, it has bred where liberated, migrated South in Autumn, and returned in the Spring to breed again in the same localities. The sportsmen's associations throughout the State will probably unite their efforts to procure a large number of quails this winter, to be liberated at various localities. The Sagadahoc Association has already voted to contribute to a general fund for this purpose, and other associations are asked to do so. The birds will be delivered in lots of one hundred or more, to clubs or individuals subscribing, in numbers proportionate to each contribution. It is to be hoped that public-spirited citizens throughout the State will contribute to the general fund, and as these birds breed prolifically, we may in a very few years have them in great abundance."

"The quails are expected to arrive about June 1st, and will be forwarded with least possible delay. You will be duly notified of arrival. The following suggestions may prove useful: Quails are *field* birds, (not of the forest;) seek food on the *ground*, chiefly seeds, or grain *that falls to the ground*; meadows and adjacent cultivated land or open fields suited to them. Liberate *twenty or more* in one place. Distribute some grain (millet seed, barley, etc..) where liberated."

"The quails imported from Italy, arrived in Portland Wednesday noon, June 9th, with but small loss by deaths while on their long journey. These birds, 2,600 in number, were purchased by private subscriptions, in order to stock the State of Maine with this fine species of game-bird, the migratory or true quail. They will be liberated in various localities, where they are expected to breed, migrate South in Autumn and return to breed each succeeding year in the same localities.

The following circular has been sent to subscribers to whom the quails have been delivered, and Mr. Smith especially desires that any person finding nests of young birds this season, or observing the return of the quails next spring, will report the same to him, by mail, to Portland, Me., that a record may be kept showing what success may be the result of his efforts, sustained by the contributions of public-spirited citizens, to introduce this fine bird to the fauna of Maine:

PORTLAND, ME., June 9, 1880.

"DEAR SIR:—I have this day received 2,600 quails (*coturnix communis*) from Italy, via New York, for distribution throughout Maine. Please report future observations of the birds to me, nesting this season, date of departure and arrival each succeeding spring, etc."

Yours truly,

EVERETT SMITH.

"Judge Martin G. Everts, of Rutland, Vt., was the pioneer in introducing migratory quail into the United States. His attention was first called to the subject by a letter from Dr. Goldsmith, published in the *Rod and Gun* in 1876. Judge Everts at once addressed an open letter to Dr. Goldsmith, then traveling abroad, and this led to a correspondence with Hon. Geo. H. Owen, then U. S. Consul at Messina, in the island of Sicily. He made arrangements to have sent him two hundred birds, and was so fortunate as to receive on the 8th of June, 1877, one hundred and ninety-seven birds, only three having died or been lost on their long journey of four thousand miles. Judge Everts makes this prediction in the *Forest and Stream*: 'that in twenty years they will be the most numerous game bird here in America.'

These birds will be a great addition to the game birds of Maine. They are prolific breeders; their flesh is fine eating, and equal in game qualities to the Virginia quail, and ruffed grouse. Like all other migratory birds they go South in the Fall and spend the Winter in a warm climate, returning North in the Spring to the place where they nested the year before. A sufficient number of migratory quail have been placed in different parts of New England to demonstrate that they come back to the very place where they were turned loose after their long voyage from Italy. The birds that were put out in Rockland last year are reported to have returned. In 1878 Mr. Dowuer released a batch on Cape Cod, and last

year they returned to the same place. Judge Everts, of Rutland, Vt., imported two hundred, and reported their return last Spring. The same encouraging reports of the return of quail come from other parts of the United States.

The habits of the migratory quail in this country are, as far as observed, about the same as in Europe. They arrive on their nesting ground in May, and migrate the last of September. Their favorite resorts are meadows and grain, particularly wheat fields. Their food consists of grain, herbs and hemp, poppy and turnip seeds. They also feed largely on grasshoppers, worms, insects and their eggs and larvæ. The female builds her nest in June and July; it is a mere depression in the ground, surrounded by a few straws, and containing from eight to fourteen greenish eggs, marked with large brown spots.

The Virginia quail which come as far north as Massachusetts, are the true *partridge*, while our so-called 'partridge' does not belong to the partridge family at all, but is the ruffed grouse.

The notes of the male, especially in moonlight nights in summer, are very clear and pleasing. A writer says of the quail: 'Every Spring or Summer morning, even before the wood thrush or robin thought of shaking up their little feather beds, preparatory to singing their morning prayers, the clear, metallic notes of the quail, in its German *Wachtel haus*, would stir the morning air. These notes, although not as sweet and melodious as old Bob White's, can be heard a longer distance, and as before remarked, have a peculiar metallic ring about them. * * * * After a preliminary strut and a guttural cluck! the quail raises itself to its full height, and then from three to eight times it repeats as near as can be written, 'Pick-per-a-wick.' There is a pause of perhaps a second between each sharp and clearly defined note. After the last note there is a pause of two or three seconds before repeating. Throughout perfect time is kept.'

It is expected that sportsmen will take an especial interest in these new comers, and that farmers on whose farms they are let loose, or on whose farms they may locate, will look after them as their own property, and report any attempt to kill them or rob their nests. A law was passed last Winter protecting migratory quail for three years, and inflicting a severe penalty on any person killing, or in any way interfering with the birds or their nests."

Quails live upon the ground in open fields, and feed upon seeds and insects. Farmers should be interested in protecting these birds for propagation, and public attention is called to the special law for their protection :

"No quail shall be killed, or had in possession except alive, any time previous to September 1, 1883, under penalty of \$25 for every offence, and \$1 additional for each quail killed or had in possession except alive.— Chap. 189, Public Laws 1880."

The general law of the State provides for their protection after the expiration of this special law.

CATS.

We mention cats, not as game, but as the most deadly enemies to our feathered game and song birds. Many instances have been already reported of quails caught by cats,

and the unsuspecting nature of these birds render them an easy prey to the feline marauders. One cat is reported as having been seen to return home with six quails in the course of a few weeks during the nesting season. Of course one can only conjecture how many that cat killed and ate without being observed by any one. Another cat was seen to bring home three woodcock.

But although the cats commit this havoc among our game birds, by far the greatest evil caused by them is suffered by the farmers, to whom a cat is a costly pet. All through the Spring, Summer and Autumn the cats venture out from their homes to seek their favorite tid-bits, the birds, and the best of care and food will not keep them from doing this. One may frequently see them crouching by the roadside or skulking along a hedge or ditch, seeking not for mice but for birds, destroying the mother bird setting on its nest and the fledgling birds. Now do the farmers realize the evil results to them caused by the death of these birds? We think not, and would therefore call their attention to what is really a serious evil.

Excepting the hawks, and other rapacious birds, all our birds are insectivorous in their habits, very many of them subsisting wholly upon insects and their eggs, of which a single bird will consume an immense number daily. But for these birds the face of the earth would be made desolate by a scourge of insects. As the birds about a farm destroy millions of insects every year, it behooves the farmer to afford all possible protection to these birds that render him such valuable service. There is a sufficient number of natural enemies to the birds to preserve the balance of nature and prevent a too great increase of birds, and the domestic cat has been introduced by man and by him should be removed.

The mischief that might be done by all the rats and mice caught by the ordinary cat in the course of the year would be but a trifle as compared to the evil results possibly due to the destruction of the birds. We urge our farmers to kill the cats. You cannot afford to keep them, unless it be in con-

finement constantly, except while the snow is on the ground and nearly all our birds are gone. Every little bird killed by them grants life to many thousands of insects.

MOOSE, DEER AND CARIBOU.

The law prohibiting the killing of moose at any time for five years, expired October 1, 1880.

Unfortunately, violations of that law deprived the State of the full benefits for which it was enacted, yet the moose has increased in numbers within the period named, and we trust that the examples made of several offenders brought to justice, and the penalty of \$100, for each moose killed or had in possession, may deter others in the future from so offending. Caribou are much better able to take care of themselves. They can travel rapidly and for long distances in the deepest snow, and owing to their roving habits, they are perhaps plentiful in a given locality one year, and none at all observed there the next year.

The violations of the laws protecting deer have gradually become better observed, and deer have increased materially in the eastern portion of the State. Unfortunately the laws of New Hampshire do not conform with those of Maine, and many deer are killed along the border during the Summer months. There seems to be an apathy among the people in that portion of our State, and there have been repeated violations of the fish and game laws, without any apparent attempt at concealment, yet no one has been public spirited enough to enter a complaint. We hope for a speedy change in that region.

We are opposed to constant changes in the laws, as experience has shown that they too often tend to make confusion, and render enforcement more difficult. We therefore recommend but a single change in our game laws, and that change such an one as will, we believe, render the law more simple and effective.

We have alluded to the desirability of uniformity in regard to close-times. The season for ducks, woodcock, and grouse

or "partridges" opens September 1st. We recommend an amendment to the laws for the protection of moose, deer and caribou, that shall make the open season conform with that of grouse—September 1st to December 1st.

September is the month when our forests are most frequented by hunters, or those in quest of health and recreation. It is very difficult to prevent one kind of game being killed then where it is lawful to kill other game, and deer are then in prime condition, and their young no longer dependent upon the does. In New Hampshire the season opens August 1st, but we regard that date as too early for this latitude. Our present law makes the open season from October 1st to January 1st. The change recommended gives no longer time for killing deer, but it cuts off the month of December, giving September instead. It sometimes occurs that the snow lies deep in our forests before January 1st, and occasions are sometimes offered when the increase of years may be slaughtered in one season during the month of December.

COMPLAINTS AND PROSECUTIONS.

Complaints for violations of the fish or game laws may be made to any warden, whose powers and duties are here given. All such complaints should be accompanied by evidence, or such information as will enable an officer to obtain the evidence necessary for prosecution and conviction.

LAWS RELATING TO PROSECUTIONS, ETC.

"An act to enlarge the powers and duties of the Commissioners of Fisheries, and Wardens.

Be it enacted, &c., as follows:

SECT. 1. The powers and duties of the commissioners of fisheries, and wardens, shall extend to all matters pertaining to game, and they shall have the same powers to enforce all laws pertaining to game as they now have in enforcing the laws relating to the fisheries.

SECT. 2. The Governor is hereby authorized, with the advice and consent of the Council, to appoint wardens, whose duty it shall be to enforce the provisions of all laws relating to game and fisheries, arrest any person violating such laws, and prosecute for all offenses against the same that may come to their knowledge; and shall have the *same power as* sheriffs and deputy sheriffs, to serve all criminal processes for violations of the provisions of any law pertaining to *game and the fisheries*, and shall be allowed for said services the same fees as are prescribed by law for

sheriffs and their deputies for like services; and in the execution of their duties they shall have the same right to require aid that sheriffs and their deputies have in executing the duties of their office; and any person refusing or neglecting to render such aid when required, shall forfeit ten dollars, to be recovered upon complaint before any trial justice or municipal court. Chapter 208, 1880."

PENALTIES AND FINES.

FISH.—"*Sect. 26.* All fines and penalties provided for in this act, unless otherwise provided, may be recovered before any competent tribunal by complaint, indictment, or action of debt; and in all actions of debt commenced in the supreme judicial, or in the superior court for the county of Cumberland, the plaintiff recovering shall recover full cost, without regard to amount recovered. Judges of municipal and police courts, and trial justices, shall have concurrent jurisdiction of all offenses described in this act, when the penalty for the offense complained of does not exceed thirty dollars. In cases where the offense described in this act is alleged to have been committed in any river, stream, pond or lake forming a boundary between two counties, or where the fish are caught in one county and carried to another county, the action, complaint, or indictment may be commenced and prosecuted in either county. One-half of all fines and penalties recovered or imposed, when not otherwise provided, shall be for the benefit of the party prosecuting or making complaint, and the other half to the county in which the proceedings are commenced and prosecuted. Chapter 75, 1878."

GAME.—"*Sect. 18.* All penalties imposed by the seven preceding sections may be recovered by an action of debt, or by complaint or indictment in the name of the State, by *any warden* or his deputies, or *any other person*, before any court having jurisdiction thereof, in any county in which such offense may be committed or the accused resides; and in all actions therefor in the supreme judicial court, or any superior court for the county of Cumberland, if the plaintiff recovers, he shall recover full costs without regard to the amount of such recovery. Such penalties, when collected, shall be paid, one-half to the prosecutor and the other to the overseers of the poor, for the use of the poor of the city or town where such prosecutor resides. Chapter 50, 1878."

THE YEAR'S WORK.

As this report is written more than a month before the expiration of the year, we must omit a record of some matters that will not be completed this year. Such as cases of violations of the fish and game laws that are in hand but not yet brought to trial, complaints that cannot be followed immediately by prosecution for lack of sufficient evidence, distribution of fish to be hatched from eggs already procured, etc.

By a careful economy of the fund at our disposal, and by devoting our whole time and energies to the work, we have accomplished much towards grand results in the future. Through the liberality of the proprietors of the Kineo House

at Moosehead lake a hatching house is now established there, and the supply of trout in those waters will be maintained by yearly hatching a large number. The whole cost of establishing this hatching house and operating it is borne by private persons. The salmon eggs to be hatched for the Kennebec river will be placed in this house. At Rangely lakes a new hatching house has been built this year by private subscriptions, and the two houses now located there will be filled with trout eggs, and the eggs of white fish, presented to Maine by U. S. Commissioner S. F. Baird, to be received from Michigan, and the eggs of salmon to be hatched for the Androscoggin river.

It will be perceived that the State is indebted to the liberality of the U. S. Commissioner, and to private persons, for many substantial benefits.

A summary of the year's work may be briefly stated as follows :

Trout. 100,000 hatched and liberated at Moosehead lake; 253,000 eggs now in hatching house at Moosehead lake; 350,000 hatched and liberated at Rangely lakes; 500,000 eggs now in hatching houses at Rangely lakes. The cost of taking and hatching these eggs is paid by private subscriptions.

Lake Salmon. 48,000 hatched and liberated at Moosehead lake; 120,000 eggs obtained this year from Grand lake stream. Total number taken by Mr. Atkins at Grand lake stream 2,375,000. We are unable to state the number taken by Mr. Jewell, as yet no report having been received from him.

California Trout. 50,000 eggs of the McCloud river trout will be received from California.

*Sea Salmon.** No funds last year for purchase of eggs, therefore no young fish to distribute this year. 530,000 eggs received from the breeding establishment at Orland; 100,000 eggs to be hatched at Moosehead lake for Kennebec river; 100,000 eggs to be hatched at Rangely lake for Androscoggin river; 100,000 eggs to be hatched at Norway for Presumpscot river; the balance to be allotted to the Penobscot and Saco rivers.

Shad. 350,000 young fish distributed at Mattawamkeag, for the Penobscot river; 350,000 young fish distributed at Waterville for the Kennebec river.

Alewives. 621 fish placed in Sebago lake for Presumpscot river; 110 fish placed in Cold lake, at Enfield, for Penobscot river.

*1,700,000 salmon eggs at Orland Breeding Establishment, obtained by Mr. Atkins.

White Fish. 500,000 eggs of the western whitefish will be obtained from Michigan. These and the California trout eggs are contributions from the U. S. Commission, the cost to the State being only the expense of transportation and hatching.

The total number of fish eggs to be hatched in Maine this Winter will be about two millions.

Several hundred salmon taken at Bucksport for purposes of propagation have been labelled with platinum tags affixed to the dorsal fin. A record of each of these salmon has been kept, and each tag has a reference number.

We request that any one obtaining possession or knowledge of any of these marked salmon at any future time, will send the tag to the Commissioners, or to C. G. Atkins, Esq., Bucksport, with such account of it as may be possible. We hope by yearly marking all the adult salmon caught and liberated in the Penobscot river to learn more of their habits.

Besides our desire to obtain a report of every marked salmon that may be caught in the future, we wish especially that whenever possible some of these salmon may be delivered *alive* to Mr. C. G. Atkins at Bucksport, to be placed in the breeding establishment at Orland. An extra price will be paid for these fish.

FISHWAYS.

Eight new fishways have been completed this year. Thirty fishways have been carefully inspected, and improvements and repairs made to many of them.

ENFORCEMENT OF LAWS.

Although violations of the fishery laws have been gradually decreasing, yet more offenders have been punished this year than ever before within the same time. Besides the prosecutions already made, there remain in possession of wardens evidence and warrants against offenders not yet brought to trial. There are other offenders resting in fancied security, but whom we hope to bring to justice at a near future time.

The following are the cases that have been brought up previous to this writing :

June 12, 1880. Catching black bass in close-time. Highland lake. Fines and costs.

June 16, 1880. Catching black bass in close-time. Highland lake. Fines and costs.

August 20, 1880. Spearing fish in Sebago waters. Fines and costs.

August 20, 1880. Spearing fish in Sebago waters. Fines and costs.

September 25, 1880. Spearing fish in Sebago waters. Appealed.

September 25, 1880. Spearing fish in Sebago waters. Appealed.

October, 1880. Sale. Sebago lake salmon. Bound over.

November, 1880. Fishing for or taking. Sebago salmon. Guilty. Bound over.

November, 1880. Sale. Sebago salmon. Guilty. Bound over.

November, 1880. Fishing with weir in Sebago waters. Guilty. Bound over.

November, 1880. Transportation, possession and sale. Guilty. Bound over.

There are some additional cases of poaching in Sebago waters yet to be brought up.

July 10, 1880. Spearing salmon. Penobscot river. Fine and costs paid.

July 23, 1880. Net-fishing in close-time. Penobscot river. Fine and costs paid.

July —, 1880. Net fishing in close-time. Penobscot river. Fine and costs paid.

May 5, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 5, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 12, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 12, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 12, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 20, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May 20, 1880. Fishing with set-lines in Moosehead lake. Fine and costs paid.

May, 1880. Using "dip-net" at a fishway. Fine and costs paid.

May 7, 1880. Transporting trout for sale in March, 1880. Fine and costs paid.

May 19, 1880. Sale of trout in March, 1880. Fine and costs paid.

June 2, 1880. Sale of perch in May, 1880. Fine and costs paid.

June 8, 1880. Fishing with set-lines in Moosehead Lake. Fine and costs paid.

July 6, 1880. Fishing with net within 500 yards of a dam. Fine and costs paid.

July 6, 1880. Sale of trout in March, 1880. Fine and costs paid.

July 7, 1880. Sale of trout in February, 1880. Fine and costs paid.

October 30, 1880. Fishing with set-net in fresh waters. Fine and costs paid.

A total of thirty prosecutions for violations of the fishery laws previous to November 1st, and greatly exceeding in number the record of any previous year since the establishment of the office of Commissioners of Fisheries in this State.

GAME LAW VIOLATIONS.

The following named cases have been brought up, and there are others in the hands of the officers, but not yet settled :

April 16, 1880. Killing one deer in March, 1880. Penalty \$40.00. Fines and costs paid.

June 4, 1880. Killing song birds in June, 1880. Fines and costs paid.

August, 1880. Killing wood-cock in close-time. Fines and costs paid.

September, 1880. Killing four deer in February, 1880. Penalty \$160.00. Indicted and bound over.

September, 1880. Killing one deer in February, 1880. Penalty \$40.00. Indicted and bound over.

September, 1880. Killing one caribou in close-time; \$40.00 and costs. Paid.

September, 1880. Trapping mink in close-time. Fined.

November, 1880. Killing one moose in close-time. Penalty \$100.00 and costs. Paid.

November, 1880. Hunting deer with dogs. Trial deferred.

There are cases now in the hands of wardens against various persons for killing moose, deer, caribou and woodcock in close-time; for snaring grouse or "partridges," hunting deer with dogs, and netting ducks.

Many past offenders have come forward and acknowledged their guilt, thereby saving to themselves costs of a trial.

Two thousand six hundred quails (*coturnix communis*—the common migratory quail of Europe), purchased by private

subscriptions and imported from Italy, have been liberated throughout the State.

One thousand six hundred copies of an "Abstract of the Fish and Game Laws" have been compiled, published and distributed.

Correspondence, to the extent of some 1500 communications written, has formed one item of our work.

Five hundred placards giving close-times, etc., for fish and game, have been distributed throughout the State; and we expect to be able to issue in pamphlet form next year a complete copy of all our State laws relating to Fisheries and Game, revised and codified. Hardly a year has passed without some change in our fishery laws. Special laws have been enacted from time to time, and some are still in force while others are not. New laws have been enacted, and old ones remain in force unless repealed by the vague expression, "all laws inconsistent with this act are hereby repealed." We have employed a skilful lawyer to make a revision and codification of all our laws relating to fish and game, and prepare the same for publication, with notes, references, etc. The work will cover the period from 1820 to 1880, inclusive, and will be an authentic and valuable publication for the reference of lawyers and future legislators, as well as a work that is needed for the use of justices, wardens, the Commissioners and others in the performance of duties connected with the Department of Fisheries and Game.

Respectfully submitted.

E. M. STILWELL.
EVERETT SMITH.

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D. B. Hundley.....Courtland.

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B. B. Redding.....“
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Colorado.

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Illinois.

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(Mr. J. Smith Briggs, of Kankakee, was on the board, but his term has expired, and no appointment has been made to date.)

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Nova Scotia.

W. H. Rogers, Inspector.....	Amherst.
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Prince Edward Island.

J. H. Duvar, Inspector.....	Alberton.
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British Columbia.

A. C. Anderson, Inspector.....	Victoria.
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NOTE.—A quail's nest may be identified by the number of eggs, from 8 to 15 to each nest. None of our native field birds lay so many.

Farmers are requested, when finding nests in hay-fields, to leave a square yard of grass standing about it; or if mowed over, to place some small branches around and over the nest, so that it may not be deserted. See article on Quails, page 36.