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THIRD AND FOURTH ANNUAL REPORTS

OF THE

STATE BOARD

OF

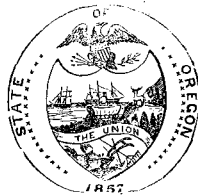
FISH COMMISSIONERS

TO THE

GOVERNOR OF OREGON.

SIXTEENTH REGULAR SESSION LEGISLATIVE ASSEMBLY.

1889--1890.



SALEM, OREGON:

FRANK C. BAKER, STATE PRINTER.

1891.

THIRD ANNUAL REPORT
OF THE
STATE BOARD OF FISH COMMISSIONERS
FOR 1889.

To Sylvester Pennoyer, Governor of Oregon:

We beg leave to submit herewith the third annual report of the State Board of Fish Commissioners, from December 1, 1888, to November 30, 1889.

Having previously filed their bonds with the Secretary of State, as required by law, the commission organized on the 20th day of March, 1889, by electing F. C. Reed president and R. C. Campbell secretary.

We deem it no longer necessary to dwell in much detail upon the importance of the work committed to our charge and the necessity for its continuance. That the artificial propagation of fish by the State is an undertaking of great importance there now remains but little doubt, and should such doubts exist we hope to remove them by referring to the reports of the commissioners of other States where the artificial culture of fish has been in operation for a much longer time than in our own State.

Let us first refer to the report of the commissioners for the State of New York, and to the Hudson river. A few years since the shad in this river were becoming so scarce that the fishermen could barely make it pay to fish for them, and it was the opinion of many that the increase in population along the banks of the river, with the increase in the manufacturing establishments, was polluting the water to such an extent that it was getting too impure for the fish to live in; but this theory has proved to be incorrect, as within the past four or five years the United States fish commission have taken the matter in hand and have been propagating shad on a large scale and putting them in the Hudson river, and the result has been that more than one million five hundred thousand shad

were taken during the season of 1888, which, the report says, has been the most successful season in twenty years, both in quality and quantity. We also have the reports from Illinois, Wisconsin, Michigan, and several other States, and it is a fact beyond any doubt that the supply of food fishes has been increased to a great extent by artificial propagation.

New York makes an annual appropriation of \$30,000 for the preservation and propagation of her supply of food fishes, the value of which will not exceed \$500,000. Illinois appropriates \$7,500 annually, or \$15,000 biennially; value of product, \$250,000. Wisconsin appropriates \$12,000 yearly, and the value of her product for the past three years, as per report, \$690,500, a little more than \$200,000 per annum.

We might go on and quote several of the other States, but as the above named represent the leading ones for fresh-water fishing we will compare them with our grand old Oregon and see if we cannot awaken our legislators and the people in general to the fact that our fishing industry is of great importance and that it must be protected and its increase promoted.

The value of the fresh-water fish industry of Oregon amounts to more than \$2,500,000 annually, as we will show before we close this report.

Now let us see what has been done by the State to promote this industry.

In 1887 the legislature made its first appropriation in the sum of \$1,000 for the purpose of erecting and maintaining a hatchery to propagate salmon, and for the support of a fish commission for the period of two years, the results of which all are aware who have read the reports of the commission for '87 and '88.

At the session of the legislature for 1889 the commission asked for an appropriation of \$15,000 for the ensuing two years with which to carry on the well-begun work. The senate passed the bill for that amount, but on its way through the house it was cut down to \$6,000, and after the legislature adjourned it was vetoed by the Governor, so that the commission for the past year have been limited in funds with which to carry on their work. While we think that the State should make a small yearly appropriation for industry that is of so much commercial value, we also think that those engaged in the business, and who derive the direct benefit therefrom, should put in a small share of their profits for the protection of this industry. With this point in view the commission, at the last session of the legislature, had a bill prepared known as house bill No. 218. Section 2 of said bill reads as follows: "That for the purposes of this Act the State shall be divided into three

fishing districts, known and designated as follows: District No. 1, to include all streams and bays included between the California State line, on the south, and Hecla head on the north; district No. 2 to include all streams and bays from Hecla head, on the south, to Tillamook head, on the north, and district No. 3 to include all north of Tillamook head, including the Columbia river and its tributaries in Oregon.

"Section 3. That every person or corporation within the State engaged in canning; preserving, dealing in, packing, shipping, buying from first hands for profit, or speculation in salmon or any variety thereof, shall pay one-half of one cent apiece for Chinook salmon, and one-sixth of one cent each for Steel-heads, and one-sixteenth of one cent apiece for Blue-backs, and one-fourth of one cent apiece for Silver-sides, taken in district No. three; and every such person or corporation shall pay one-half of one cent apiece for each Chinook salmon and one-fourth of one cent apiece for Silver-sides taken in districts Nos. one and two.

"Section 4. That all moneys made payable or collectible by this Act shall be due and payable semi-annually within thirty days after the first of March and the first of September of each year hereafter, to the State Treasurer, which money shall constitute a fund to be known and designated as the fund for the benefit of the salmon industry, the money to be credited to each district respectively in proportion to the amount received from each, and appropriated as may seem proper by the legislative assembly for the benefit of the industry in the respective districts from which it accrued only."

This bill was shown to all the prominent salmon packers in this State and met with their approval, and was passed by both houses of the legislature with scarcely a dissenting vote, and if it had been allowed to become a law the revenue derived therefrom would have been sufficient for the protection and propagation of salmon in our waters for all time to come; but it shared the same fate as the one appropriating money from the State.

The catch of salmon in Oregon for the past season will fall somewhat short of the catch for the season of 1888. There has been packed on the Columbia river, including the Washington side, 328,000 cases, or 15,600,000 pounds, which requires about 1,000,000 salmon; against 352,000 cases in 1888. The shortage is mostly from the vicinity of the Cascades, and was owing to the extreme low water, which prevented more than one-half of the fish-wheels from taking any fish, and many of those that did take fish only run for a short time and caught but few fish.

The other streams on the coast of Oregon which have been fished during the season have turned out fairly well. The pack on the

Nehalem was about 6,000 cases; Tillamook, 9,500 cases; Nestucca, 6,700 cases; Yaquina, 5,000 cases; Alsea, 10,000 cases; Siuslaw, 12,000 cases; Umpqua, 12,000 cases; Coquille, 8,600 cases; Coos bay, 7,000 cases; Rogue river, 22,000 cases, 14,000 cases of which were spring salmon. The above figures will make a total for Oregon, including the Columbia river, of about 426,800 cases.

During the month of February quite a number of salmon were caught in the Columbia river, and also in the Willamette and Clackamas rivers, which were shipped to Portland. March being a close month, no fishing was done. The first of April fishing began in general all along the river, and twenty-four of the packing establishments began operations, against twenty-nine in 1888, but we think nearly the same amount of fishing gear was in use during the past season as was used in 1888. As nearly as we have been able to ascertain, the following amount of gear has been used on the Columbia river during the past season:

About 1,500 gill-nets have been operated, the average length of each being 300 fathoms, depth 4 fathoms; these are used all along the river from the bar to the Cascades, a distance of 150 miles, and near the Cascades a great many set-nets are used, which are not included here. Number of square miles fished by gill-nets on the Columbia river, 280.

The number of seines in use during the season, 30; average length 300 fathoms, average depth 6 fathoms; used from Fort Stevens to the mouth of the Willamette, 100 miles. Number of square miles fished by seines, 15.

Number of pound-nets, 127; average length of lead 100 fathoms, depth of water at the pot or pound at low water, 2 fathoms; used from Fort Stevens to Harrington's Point, a distance of 20 miles. Square miles fished by pound-nets, 20.

Number of slat-traps used, 30; length of lead 50 fathoms, depth of water at pocket at low tide, 2 fathoms; in use from Harrington's Point to Willamette, a distance of 80 miles. Number of square miles fished by slat-traps, 15.

Whole number of fish-wheels on the Columbia river, 44, of which 27 are stationary and 17 are built on scows and can be moved from place to place. They are used from Bridal Veil falls to the Cascades, a distance of 20 miles, and again from Three Mile creek to Celilo, a distance of 10 miles. Number of square miles fished by wheels, 20.

OPERATION AND RESULTS OF THE LAW.

Under this head we will say but little in this report, as in our last we gave a full account of the operation of our present law, and

made several suggestions and recommendations whereby the law could have been greatly improved. The legislature looked upon all of them favorably and passed nearly unanimously every bill which the commission recommended relating to the fish industry, and yet all failed to become laws.

There were seven arrests made on the river for fishing with gill nets Saturday nights, five of whom plead guilty before the justice of the peace, paid their fines and were discharged; two plead not guilty and were bound over to appear before the grand jury, where a true bill was found, and the case put over to the next term of court.

There were six arrests made for fishing with pound nets on Saturday nights, five of whom were bound over to appear before the grand jury, and not a true bill was found in either case. We will say here that the officers of the Fisherman's Protective Union assisted us to a great extent in enforcing the law in regard to the traps.

On the upper Columbia the law has been very well observed, only one arrest having been made during the season, and that was at Celilo for taking fish on the first day of August. The party was bound over to appear before the grand jury, but a true bill was not found.

On the first day of April we received complaint from citizens of Douglas county that a certain dam in the vicinity of Elkton had no fishway. We went and examined the dam, and learned from the owner that the dam was built before the law was passed, consequently he could not be compelled to maintain a fishway; but in order to let fish pass the dam he had built a fishway, which, at the time we were there, was somewhat out of repair; the owner, however, agreed to repair the ladder and thereby save all trouble.

During the latter part of August we received complaint from Jackson county that illegal fishing was going on in the vicinity of Gold Hill. We went there and found an old brush and rock dam across Rogue river with an opening in it which was called a fishway, and fish had gone through the opening in large quantities. We also found two fish traps at the dam, one above and the other below. Complaint had been made against the one below, and suit was brought in Jackson county and the offender was made to take out his trap and pay a fine.

In October we received a communication from Roseburg to the effect that the dam across the Umpqua river at that place had no fishway in it, and that settlers above the dam were deprived of getting any fish to eat. We went to Roseburg and examined the dam and found an opening left therein which the owners called a

fishway, and say that it was left for that purpose. Upon inquiring we found a number of the citizens of that place who had seen fish go over the dam through the opening, and under these circumstances we concluded it was a lawful fishway. We, however, advised the owner of the flour mill to improve the fishway a little by blasting away the rocks to give the fish a chance to rest, and thereby make as good a fishway as could be put in; this he agreed to do as soon as the water was low enough.

We also had complaints from Benton county in regard to parties setting nets and traps across the streams, but being very busy at the time we did not go in person, but wrote to the parties making complaint that there was no law to prevent persons from setting nets or traps across any stream in this State. This was a very important section in the bill passed at the last session of the legislature and which failed to become a law.

We will make no recommendation at this time, as we consider those in our last report, and acted on by the last legislature, sufficient for some years to come, and we will renew them at the proper time.

METHODS OF FISHING.

The methods of fishing remain the same as in our former report. We noticed during the past season that the feeling of enmity or jealousy which existed between parties using the different kinds of gear is dying out to a great extent, and that many fishermen built traps last spring that have always fought them before.

HATCHERIES.

At the close of our last annual report we had turned out from the Clackamas station about 1,000,000 young fish, and still had 4,500,000 eggs and young fry in the hatching house. Owing to the mild weather during the winter, we had excellent success with the eggs and young fry, and by the first of February all had been turned out, amounting in all during the season to more than 5,500,000 young salmon, or more than three times the number of fish taken on the whole river during the season.

The young fish were all let loose in the Clackamas river, with the exception of 40,000, which were taken to the Columbia and let loose at Bonneville.

We think it would have been better to have taken more of them to the Columbia river, but we could not do so, as the expense was quite large and we were short of funds.

In connection with hatching and distributing young fish we wish to call your attention, and the attention of the public, to the great work of the United States fish commission.

About the first of February we received notice from Colonel McDonald, United States commissioner, that a car-load of lobsters and whitefish eggs were on the way to Portland, Oregon, the lobsters to be distributed on the coast of Oregon and Washington, and the whitefish eggs to be hatched out at Portland and distributed in Cœur d'Alene and Pen d'Oreille lakes. We immediately telegraphed to Colonel McDonald for some of the lobsters to plant in Yaquina bay, and promptly received an answer that we could have them. The Southern Pacific and Oregon Pacific railroads very kindly offered us free transportation from Portland to Yaquina, but the United States fish commissioners' car arrived in Portland one day earlier than we expected, and the man in charge, Mr. Ellis, not knowing of our arrangements, and the lobsters having been confined about as long as they would stand it, immediately on his arrival in Portland sent half of the lobsters to Astoria on the night boat, and they were taken to Cape Disappointment and let loose there, and the remainder were sent to Tacoma and put into Puget sound.

I am credibly informed that young lobsters have recently been found in Shoalwater bay, and if such is the case they are undoubtedly the offspring of those planted at the Cape last winter.

Of the whitefish we received about 200,000 fry for Kullaby lake, on Clatsop plains, and they were taken down by Mr. Eben Tallant, who took great interest in the matter.

On the application of Geo. T. Myers we secured for him 300,000 fry, which were taken to Lake Washington, in Washington, and 200,000 were put in Silver lake, in the same State; and on application of Mr. Wm. Steel, of the Portland Alpine Club, about 500,000 fry were taken to Klamath lake, Oregon. The balance were taken to Cœur d'Alene and Pen d'Oreille lakes, in Idaho.

During the time the whitefish were being disposed of we were in communication with Col. McDonald to allow the car to go to the McCloud station, in California, and get a load of young salmon to be distributed in the Rogue river, at Gold Hill, Oregon, and in the Umpqua, at Roseburg, and some to be hauled with teams to the headwaters of the Coquille. Manager Koehler, of the Southern Pacific railroad, took a great interest in the matter and kindly gave us transportation for the car and party from Portland to Redding and return; but on our arrival at the McCloud station we found that through some misunderstanding between Col. McDonald and Prof. Stone, commissioner in charge at McCloud, the young fish had all been turned out a few days before we arrived there. Although we were all greatly disappointed in not getting the fish, we think that credit should be given both to the United States and State commissioners, and thanks to the railroad company who so kindly aided us.

On the first of March, the young fish having all been turned out, we again gave up charge of the Clackamas station to the United States commission, and it has been under their management since, and will remain so during the winter. We will not take charge to hatch the eggs and turn out the young fish, as we did last season, for two reasons: First, we have not sufficient funds to defray the expense of the station for three months; second, Col. McDonald, United States commissioner, made a short visit to this coast to inspect the United States stations on the McCloud and Clackamas rivers, arriving here about the first of August. He was well pleased with the location of the Clackamas station and its surroundings, but thought the Clackamas river too small for the amount of young fish which were being put therein.

Therefore we made arrangements with him to build an auxiliary station somewhere on the Columbia river where the eggs could be taken from the Clackamas station and hatched out and the young fish be planted in the Columbia. With this in view we took steps to secure a suitable location for this purpose—the United States commission to help defray the expenses if necessary. He also assured us that all the eggs taken at the Clackamas station would be hatched and planted in Oregon waters, and upon this assurance from him we agreed to let the United States commission continue in charge at Clackamas, and we would spend what money we had in hatching out and planting the fish at the station on the Columbia.

We examined Multnomah and Horse Tail falls, and in fact all the suitable places as far up the Columbia as the Cascade Locks, and finally settled on Warrendale as the best and least expensive place. Multnomah Falls is an excellent place to locate a station of this kind, but the expense of putting up buildings and getting water into them would be too great at present.

At Warrendale all this expense was saved, as the proprietor, Mr. F. M. Warren, kindly gave us the use of a part of his cannery, with an abundant supply of good spring water already brought to the building. We put in troughs and fitted up the place for 1,000,000 eggs, and have taken that number from the Clackamas to the Warrendale station, having had the best of success so far, as the loss in shipping was not more than 1 per cent. The eggs at this station have all hatched, and by the latter part of December they will have been planted in the waters of the Columbia.

We will now call your attention to the work of the United States commission at the Clackamas station. They have taken this season about 4,500,000 eggs, and have been very successful in hatching them. The loss of eggs this season will be much less than last, for

the reason that Commissioner McDonald, on his visit to the station in August, ordered a steam pump put in the hatchery, so that water for hatching purposes could be taken directly from the Clackamas river, instead of from Clear creek, as in former years, the water from the latter stream being too warm in August and September.

It is safe to say that there will be planted in the waters of this State as this season's work, 4,250,000 young salmon. And from conversation with Commissioner McDonald during his visit, we may expect in the near future to see the capacity of the United States fish-breeding stations on this coast increased and perhaps new ones erected.

We have noticed that in all States where fish-breeding has been started, the State commissioners have worked in connection with the United States commission, and think that far better results can be obtained with the same expenditure of money by so doing.

In connection with fish-breeding we will say that we took some salmon eggs from the Clackamas station and had them on exhibition at the Industrial Fair at Portland. The people took a great interest in them, more especially after they began to hatch and the young fish could be seen moving around. But in a few days after they were hatched out they were all killed, owing to a defect in the connection of the water supply, hot water being run through the pipes. We also placed some eggs on board the United States fish commissioners' steamer Albatross, which was stationed at Portland ten days during the fair; the eggs hatched out and the young fish thrived well. This goes to show that the water in the vicinity of Portland is not poisoned to such an extent by the sewerage of the city as to kill young salmon, as has been argued heretofore as one great objection to the Clackamas as a breeding-station; for the water in which the eggs were hatched and the young salmon lived when on board the steamer was pumped from near the bottom of the Willamette, close to the wharves in the city of Portland.

EXPENSES INCURRED.

Name.	On What Account.	Amount.
F. C. Reed	Salary	\$ 1,500 00
F. C. Reed	Incidental expenses	25 00
E. F. Thompson	Salary	200 00
E. F. Thompson	Incidental expenses	200 00
R. C. Campbell	Salary	200 00
R. C. Campbell	Incidental expenses	Not rep'd
Total		\$ 1,925 00

*HATCHERY EXPENSES.

To Whom Paid.	Amount.
Goldsmith & Loewenberg.....	\$ 42 46
Honeyman, DeHart & Co.	14 60
Dean Blanchard.....	22 50
Nicolai Bros.....	19 92
M. Pomeroy, for labor.....	55 00
F. C. Reed, paid for labor and material, as per bill.....	19 00
Total.....	\$ 173 48

Estimated expenses from November 30, 1889, to January 1, 1890, including salaries for quarter ending December 31, 1889.....\$ 1,000 00

STATISTICS OF THE SALMON FISHING INDUSTRY OF THE STATE.

There have been packed on the Columbia river and streams wholly within the State during the season of 1889, as nearly as can be ascertained, the following number of cases of salmon :

Name of river.	No. cases.
Columbia, spring pack.....	325,000
Columbia, fall pack.....	3,000
Nehalem.....	6,000
Tillamook.....	9,500
Nestucca.....	6,700
Yaquina.....	5,000
Alsea.....	10,000
Siuslaw.....	12,000
Umpqua.....	12,000
Coquille.....	8,600
Coos Bay.....	7,000
Rogue River, spring pack.....	14,000
Rogue River, fall pack.....	8,000
Total.....	<div> Cases 426,800 or Pounds 20,601,600 </div>

There is a shortage from the pack of '88 of 33,000 cases, 20,000 of which we have already accounted for in the vicinity of the Cascades. The coast streams are short the balance, not so much on account of the scarcity of fish (the run being an average one in all the coast streams, and the fish are better quality than in former years) as of a falling market, and the packers did not care to handle the fish unless there was a small profit made on them.

The statistics given so far are for salmon that have been packed in tin cans; when we add to this the amount used fresh in our home markets, which is about 1,000,000 pounds, and those shipped

*The expenses for hatchery have been incurred during the present quarter, and will not be paid until January 1, 1890.

to the Eastern markets, which amount to 1,500,000 pounds, and those consumed by the Indians and cured for their winter's use, and the amount the resident fishermen have salted for their winter's use, it will swell the sum by at least 2,000,000 pounds, making a grand total of 25,101,600 pounds of salmon that have been taken from our waters during the season of 1889.

Now let us see what the commercial value of this industry is to the State. There have been packed 426,800 cases in tin cans; of these 300,000 cases were first-class goods and sold at an average of \$6.25 per case, or \$1,875,000; 126,800 cases were second quality, or fall salmon, and sold at an average of \$5 per case, or \$634,000, making the total value of salmon packed in tins on the Columbia river and streams wholly within the State, \$2,509,000. The 2,500,000 pounds that have been shipped East and consumed in our home markets fresh can safely be considered worth 8 cents per pound, making \$200,000, which, added to the \$2,509,000 for canned goods, makes a grand total of \$2,709,000.

As will be seen by the foregoing figures, the salmon industry of this State is of vast importance, and should receive more consideration from the general public than any other. Why? Because thus far it has cost nothing to produce the salmon that have been taken from year to year; they have neither had to be fed nor sheltered, sowed or reaped—we were about to say; but, alas! while the sowing has been begun but recently, the reaping has been going on for more than thirty years; but the time is near at hand when the harvest will surely fail unless more attention is given to the planting.

In our last report we gave some facts in regard to planting salmon in the Rogue river and the results obtained therefrom. The good work is still going on there, as about 25,000 young fish were planted the past season, with a fair prospect for nearly a million for this season.

There has been some talk through the newspapers and otherwise in regard to illegal obstructions being placed across Rogue river at or near its mouth. While we have not received any complaints, we have been informed that for a short time a rack was placed across the river near the falls for the purpose of obtaining salmon from which to secure the eggs for the hatchery. This is allowed by law on any stream in the State, and from the quantity of salmon taken at Gold Hill, one hundred miles up the river, and shipped to Portland and the canneries on the Columbia, we think they have not been obstructed to any great extent.

In the beginning of this report we gave some facts in regard to the planting of shad in the Hudson river and the results obtained

therefrom. Now, to impress the importance of planting fish more fully upon the minds of all who may read this, and to convince those who may have some doubts as to the results of fish culture, we will refer you to the salmon pack of the Frazier river, just over the line in British Columbia. We quote from the report of Mr. Thomas Morvat, inspector of fisheries for the province of British Columbia. He says there has been turned out from the hatchery on the Frazier river since it commenced operations the following number of fry:

The year of 1885	1,800,000
The year of 1886	2,625,000
The year of 1887	4,414,000
The year of 1888	5,807,000
Total	14,646,000

As will be seen by his report, there has been a steady decrease of salmon in the Frazier river since 1882. In 1885 the first fry from the hatchery was turned out, amounting to 1,800,000 young fish. This being the fourth year thereafter, is, consequently, the first year that they could look for any results from the planting, and they have surely not looked in vain, as they have put up the largest amount of fish this season that has ever been packed on the Frazier river since the beginning of the industry, 362,000 cases. This is more than has been packed on the Columbia this year, although the Columbia contains about 300 square miles of fishing ground and the Frazier only about 60 square miles.

With the encouraging reports from the Frazier river hatchery, and those given in our last report from the Rogue river hatchery, we shall look forward with great interest to the season of 1891, when we may look for the return of the first fish planted by the State commission in 1887.

Recapitulation of the salmon industry of the State and of the Pacific slope:

Name of Place.	Number of Cases.	Value.
Columbia river and streams wholly within the State	Consumed fresh, 426,800 2,500,000 lbs 85,000 70,000 680,000	\$ 2,509,000
Streams in Washington		200,000
California		425,000
Alaska		420,000
Total for the United States	1,261,800	\$ 6,954,000
British Columbia	422,000	2,110,000
Grand total	1,683,800	\$ 9,164,000

While there has been a falling off in some streams it will be seen that there has been an increase in the entire coast pack of 511,800

cases over the season of 1888, due to the Alaska and British Columbia pack.

So far we have confined ourselves entirely to salmon; now let us see what other varieties of fish we have, and their commercial value. Sturgeon shipped to Portland during the season of '88, the greater part of which were re-shipped to Eastern markets, 686,729 pounds.

This, at 5 cents per pound, amounts to.....	\$34,336 45
Shad, 50,000 pounds, at 5 cents.....	2,500 00
Smelt, 120,000 pounds, at 8 cents.....	9,600 00
Tom cod, 10,000 pounds, value.....	800 00
Total.....	\$47,236 45

Our sturgeon, shad and smelt fishing has but fairly begun, and are destined to become important industries in the near future, as there are at the present time about ten tons of sturgeon being received daily at Portland, to be frozen and shipped to Eastern markets, giving employment to about three hundred men at good wages.

Our salt-water fishing has been started the past season by the Deep Sea Fishing Company, of Portland, under the management of Mr. Luther Maddock, who is well versed in that kind of fishing, having been reared in it on the coast of Maine. He has made a success of the enterprise this season, and has concluded to make Oregon his home and deep-sea fishing off its shores his business, and we can look for great developments in this industry in the near future.

Before closing our report, we think we are but expressing the sentiment of the people of the State in extending thanks to Col. McDonald, commissioner for the United States, for granting the request of the managers of the Fair to allow the Albatross to visit Portland during the Fair, as it can be safely estimated that more than 50,000 people visited her during the ten days she laid there, and Captain Tanner, her officers and crew, will long be remembered by all who visited her for the courteous manner in which they were received.

We also think great credit is due to the United States commission for the good work they are doing with this steamer in locating the different banks and shoals off our coast where the several varieties of salt-water fish can be found, for in doing so they will help to open up an industry that will be of vast importance to the State.

We also acknowledge one obligation to the United States commission for gift of the use of their car No. 3 in going to the McCloud station for young salmon for distribution in Oregon waters, to Mr. J. F. Ellis, superintendent in charge of the car, and to the boys

who comprised the crew, for courtesies extended and the good will with which they performed their work.

We are indebted to our railroads, as before stated, for facilities afforded us in transporting eggs and young fish, and for accommodating us in this when it was inconvenient for them to do so.

To the press of the State we owe much of the interest awakened in the propagation and protection of the fish industry. We have been severely criticised at times, but have ever found them as ready to bestow praise as censure.

In conclusion, we desire to say in all modesty that we believe our work is doing much to awaken the people throughout the different sections of the State to the importance of the fishing industry, and we think much of the unbelief in the artificial propagation of fish which has heretofore existed has been overcome, and for this work the commission has been at least partially responsible. The benefits arising from such work are being better understood and appreciated from year to year, and the past results, both of the United States and the various State commissions, have been sufficient to encourage the most sanguine hopes for its future success.

Respectfully submitted,

F. C. REED,
E. P. THOMPSON,
R. C. CAMPBELL,
Commissioners.

FOURTH ANNUAL REPORT
OF THE
STATE BOARD OF FISH COMMISSIONERS
FOR 1890.

To His Excellency, Sylvester Pennoyer, Governor of Oregon :

SIR: We have the honor to submit herewith the fourth annual report of the State board of Fish commissioners, from December 1, 1889, to November 30, 1890.

As each year rolls around it brings more evidence of the vast importance of our fishing industry, and of the good results that may be obtained from a small amount of money judiciously spent in the artificial propagation of fish; and, as "seeing is believing," we think we can safely say that this State has received back, during the fishing season of 1890, all the money that has been expended in the propagation of fish during the past three years.

We believe that much of the increase in the run of salmon in the Columbia river the past season was the result of the first year's work of the Clackamas hatchery, and that some of the young fish which were turned out in 1887 came back this year.

It is well known by all who have been packing fish on the Columbia river for the past five years or more that the fish are larger in May than in any other month, averaging through the month about 20 one-pound cans to the dressed fish. This year the fish in May were much smaller, averaging about 16 one-pound cans to the fish. While there were perhaps, as many of the large fish this season as in the past, there were many more of the smaller ones, and of about one size, which is good evidence that they were some of the products of the Clackamas hatchery. For further evidence read what Mr. Wm. H. Vincent, a man of thirty years' experience on the Fraer river, has to say, which will be found further on in this report. United States Commissioner Livingstone Stone, another good authority, has said "that some of the young

fish would return the third year, more the fourth, and some not till the fifth." Another year, however, will fully demonstrate the facts, and we look for a better run of salmon in the Columbia river during the season of 1891 than has been seen for the past five years, all other conditions being equal, such as the stage of the water, etc.

We still wish to keep the important subject of fish culture before the minds of the people; and in order to do so we will refer you to our last report, in which we gave the workings of the commissions in some of the Eastern States, also the amount of money appropriated by each State for the propagation of fish; and we trust the members of the coming legislature will carefully read and consider the facts we have laid before them and make liberal appropriations for this great work.

We will make but few recommendations in regard to changes in the fish laws of the State at the present time, as the laws we recommended at the last session of the legislature were all passed and will come before the next legislature to be acted on a second time, and we hope will become laws.

We wish particularly to call your attention to one section of fish bill No. 135, which makes it unlawful to deposit sawdust and other mill waste in any stream in the State. This is all important, for two reasons: First, sawdust in all small streams will surely drive all the fish from the stream in a few years; second, sawdust in a few years will pollute the waters of our small streams to such an extent as to make it wholly unfit for domestic purposes, and even stock will not drink it. Why should this be allowed when it can be prevented at a very small expense to the mill owners? The mountain streams of our State are one of its most attractive features, being unsurpassed for their supply of fine trout, affording recreation and amusement to hundreds of our people; also for the beauty of their clear, cold water, that, in its course down the hillsides and through the vales, is such a boon to man and beast. Our present sawdust law was made to take effect only on the Columbia river and its tributaries below the falls of the Willamette and the cascades of the Columbia. While we do not approve of letting sawdust into any of our waters, we think it is not as injurious to fish below these points, where the rivers are large, as it is in the smaller streams, and more especially where the fish go to spawn, the greatest injury from it in the larger rivers being in filling up the channels and obstructing navigation. We are glad to notice that this has been looked after by our senators and representative in congress, by a clause in the river and harbor bill which forbids the owners of any mill or factory, or any employé therein, to cast any sawdust or other mill waste, etc., into any navigable waters of the United States.

During the year we have visited many different parts of the State, both on complaint from citizens and for our own information.

Early in May we went to North Powder on complaint of Mr. J. N. Saunders. On arriving there and interviewing the gentlemen we were informed that the river was so high that the obstruction was covered up with water and could not be seen, and the probabilities were that with the high water the fish would pass up without any difficulty. Also stopped at LaGrande and examined the Grand Ronde river at this point. At the time we were there the river was so thick with mud, from the effects of mining above, that it was impossible to see a fish; therefore, we were unable to decide if migratory fish were in the habit of frequenting this stream; and, if the mining operations go on all summer, we do not think the fish will try to go up, as it is doubtful if they could live in its muddy waters. In regard to the building of fish-ways over dams and natural obstructions we think the fish commission should have authority to decide where they are needed, as, in many cases, complaints are made where the only fish ever caught in the stream are brook or mountain trout, which are not migratory fish, and will do just as well above a dam or other obstruction as below it; in fact, we have seen good fishing in a stream above three dams, where scarcely a fish could be caught below the lower one. The complaint of the settlers above most of these dams is, that in former times they could get all the fish they wanted, and now they are getting very scarce. They evidently forget that the country is filling up with people all the time, and where there used to be but two or three persons to fish a small stream there are now fifty or a hundred.

We were requested by the Governor to go to Meacham creek, on complaint of Mr. A. H. Todd. We did so, and on arriving there, found a very small brook, which, Mr. Todd informed us, at one time contained a good many trout, which are now getting very scarce from the effects of sawdust. There were two small portable mills on the creek above Mr. Todd's, and they had been putting sawdust in the stream for some time, as the water was of a dark, inky color, and Mr. Todd informed us that stock would not drink it, nor was it fit for domestic use. We informed him that the fish commission had no jurisdiction over the matter, but that he had recourse under a law prohibiting the depositing of any substance into our streams which would pollute the water.

In July we received a complaint from John Haley and others that a dam had been built across the North Santiam, which prevented the fish from ascending the river. We visited the mill and found that a dam had been built by Mr. Brown. We instructed him to put in a fish ladder as soon as possible, which he agreed to

do. He began work on the ladder soon after, but in October we were again notified that the ladder was not finished, and we also received word from Mr. Brown that he had sold out the mill to other parties from Corvallis. We looked up the parties and went to the mill with them, and after looking the ground over more carefully, came to the conclusion that the fish-way started by Mr. Brown would be of little use, and ordered the present owners of the mill to put a ladder in the dam which would be much better. In order to do this they will have to tear the dam down, and, as they have a few logs in the pond which they wish to saw before letting the water out, they asked time to do so, which was granted, providing they would have the fish-way completed before the 1st of April, 1891, as that would be as soon as any fish would get there to go up.

Early in August we made a trip to Wallowa lake to examine the so-called "red fish" that are found there. We found them to be what we had always supposed, the genuine Columbia river "blue back." These fish when near their spawning time turn red on the outside; the fine red color, which is in the flesh when the fish are caught in the lower river and are in good condition, appears to leave the flesh and come out into the skin as they near their spawning season, for we examined several of them there and found the meat nearly white and quite soft, and, in our opinion, wholly unfit for food, and the law forbidding the catching of them after the 10th of August is a good one. This lake is becoming quite a summer resort for the people in that part of the State, as, when we were there, quite a number of campers were on the ground, and more coming every day; and it is natural for these people to catch fish when they can see them. For this and other reasons we think the use of the spear and hook on poles, by means of which these fish are taken, should be prohibited by law. It is the most barbarous, cruel, and destructive mode of taking fish that has yet been invented; in fact, this mode was never invented, but was handed down to the white race by the Indians, who never possessed any inventive power. The spear is the most destructive, for the reason that it is seldom used except in small streams and shallow water, where the fish go to deposit their spawn, and for every female fish taken in these places it destroys the prospects for five thousand young, as that is about the average number of eggs in each parent fish. Beside what fish are actually taken, as many more are cruelly maimed and torn with the spear and left to die in the stream. While we have always maintained that no mode of taking fish should be done away with for the benefit of any other mode, we do think that the use of the spear should be abolished for the benefit of the fishing industry in general.

Many of the settlers around the lake complained of there being obstructions, such as nets and traps, placed across, or nearly across, the river below, in such a way that they stopped nearly all the fish from coming up. This was considered by the commission two years ago, and a clause was inserted in the bill which passed the legislature making it unlawful for any person or persons to occupy with weir, trap, net, or other structure for taking fish, more than one-third the width of any stream in this State. This was an important feature in the bill and should become a law. "Another complaint was made by the people in that part of the State, and we find it general where irrigating ditches are in use, that during April and May, when the streams are full of water, a great many young fish of all species, as they are descending the stream, are run into these ditches and carried out on the farms and left to perish. A law should be enacted requiring the owners of all ditches, both for mining and irrigating purposes, to put a screen of fine wire netting across the mouth of all such ditches where water is taken from a stream inhabited by fish, and to keep it there during the months of April, May and June. This will not be a hardship to anyone, as but very little water is used during those months, and the screens can be so arranged as to interfere very little with the flow of water."

On our way back from Wallowa we stopped at Lostine and went up the west or main fork of the Wallowa river. Here we saw quite a number of Chinook salmon on their spawning ground, and think if a rack was built lower down the river, say in the vicinity of Wallowa bridge, a good many eggs could be taken and hatched there. Here, as in other places, the deadly spear had done its work.

In August we were requested by Mr. James Crawford, commissioner for the State of Washington, to accompany him up the Columbia river and aid in selecting a site for the State of Washington to build and operate a salmon hatchery. This may have been outside of our duty, but as Commissioner Crawford has not had the experience necessary to determine on a good location, and knowing that whatever is done in the new State in the way of propagating salmon in the Columbia river and its tributaries will be of as much advantage to Oregon as to Washington, we deemed it best to lend all the aid in our power toward the advancement of this great work. With this in view Mr. Reed went with Mr. Crawford as far as Kettle falls on the Columbia river, also examining the Spokane and Little Spokane.

We made a trip up the McKenzie river to see if there were any salmon there, having often heard from the settlers in that vicinity that they were frequently seen. We went about twenty miles up

the river, but were unable to see any. Found it a fine mountain stream and very suitable for salmon to spawn in on account of its many shoals with gravelly bottom, and we believe if a fishway were constructed over the falls at Oregon City that it would be as fine a stream as we have in the State for salmon.

Thinking we would, at the coming session of the legislature, recommend that a small appropriation be made with which to make a fishway over the falls at Oregon City, we went there in September, when the water was low, and made a careful examination, and came to the conclusion that, by removing some comparatively loose rock and doing some blasting along the east side of what is called the island, a good and permanent fishway could be made in the rock without woodwork. We had this project in view more than a year ago, and when Col. McDonald, United States commissioner, was on this coast, we, in company with him and Senator Barin, who we will say is very good authority on the fish question, visited the falls and laid our ideas before them, and after they had looked the ground over they came to the same conclusion, and that it could be made with the expenditure of a small amount of money.

We therefore recommend that the legislature make an appropriation of \$5,000, or so much thereof as may be necessary, for the construction of a fishway over the falls of the Willamette river at Oregon City. This will not only open up three of the finest streams in the State for salmon to spawn in,—the two Santiams and the McKenzie,—but will enable the inhabitants along the Willamette above the falls to secure a supply of good, wholesome and cheap food during the fishing season.

At your request we went to Philomath to investigate a complaint from J. C. Roberson. On arriving there we were unable to find Mr. Roberson or any one that knew him or where he lived, so returned and wrote him a letter, addressed to Philomath, where his letter was dated, giving him all the information we could, and, after the usual ten days, the letter was returned to us marked "uncalled for." His complaint was that sawdust was put in a stream, over which we had no jurisdiction, as it was a tributary to the Willamette, above the falls.

We also had letters from settlers on the Nehalem, making the same complaint, but, as the Nehalem empties into the Pacific ocean, we could do nothing for them. Thus is shown the necessity of having a general law in regard to depositing mill-waste into our streams.

We were informed late in September that a dam had been built across the Clackamas river by the Gladstone Mill Company, which prevented the salmon from ascending the river. We went there.

and found a rock and brush dam, about three feet high, had been built, and at low stages of water in the river was an impediment to the passage of fish. The owners were ordered to construct a fish-way through the dam, which they immediately did. Soon after we received word that some fishermen had taken possession of the fish-way and were taking fish therefrom. As soon as the report reached us they were ordered to vacate the premises and to do no more fishing within the required distance from the fish-way.

The above work, with the addition of enforcing the law on the Columbia river, has kept the commission very busy during the past year.

We have also refitted the hatchery at Warrendale, and have taken about 800,000 eggs from the Clackamas hatchery to this place to be hatched and the young fish let loose in the Columbia river.

The question has been raised during the season as to the necessity of taking eggs from the Clackamas station to Warrendale. Some claim that they may as well be hatched at Clackamas as at Warrendale. If those interested will kindly turn to page 10 of the fish commissioners' report for 1888 and 1889 they will find one very good and substantial reason given by United States Commissioner McDonald, and we doubt if any one will question this authority. Another and equally good reason why this should be done is, it is claimed, and we think justly, that the fish will always return to the stream in which they were planted; and as the work of propagating fish is done for the common benefit of the people of the State, they should be distributed where they will do the most good, and we think the people of the upper Columbia are justly entitled to some of these benefits; besides, we think the Clackamas far too small a stream for 4,000,000 or 5,000,000 of salmon to inhabit, when they may be put in equally as suitable places in the Columbia.

While we are under the head of fish breeding we ask our readers to allow us to copy from "the father of fish breeding" the following, which we feel sure will be of interest to all:

FISH CULTURE.

BY SETH GREEN.

During the few years which have intervened since the discovery of fish culture, its practice has advanced with rapid strides, and although it is still little more than in its infancy, the laws which govern its management have been so far ascertained and applied

that it is now an established art, capable of yielding vast results for the benefit of mankind.

The days of doubt and uncertainty have passed away, and numerous experiments, leading invariably to the same end, have established it on a firm basis. For a time cautious persons, even when most enthusiastic, could not help questioning in their own minds what the final outcome would be, and whether all that was predicted for the new undertaking would be realized; but success in all well-considered and properly-conducted attempts has swept away fear and hesitation, and experience may now be said to have fully confirmed the highest hopes of the most sanguine.

The possibilities which fish culture suggested were far beyond what can be obtained in other fields of human labor, so greatly exceeding the best results in agriculture that it seemed impossible that they could be realized or that this enterprise would have remained so long undiscovered or undeveloped. But day after day and year by year the theory has been put into practical operation, where all its steps could be and were more accurately noted, and the incredible increase and profit obtained left but one conclusion. No person could be more cautious, more slow to express a positive opinion or to accept a hasty judgment than the writer, but he feels at last that the public can give perfect credence to the claims of fish culture, provided that it be conducted as intelligently and wisely as other departments of human labor.

It must not, however, be forgotten that this new art is as exact and exacting as any other, nor that it has its limits and must be managed with care and not slurred or slighted. To the indifferent and ignorant it will yield no more than the cultivation of the land, and possibly not as much. Before entering on the details of practical management, it may not be unadvisable to take a general review of fish culture, and give some suggestions of practical application. It has been said that an acre of water would produce as much as five acres of land, if it were tilled with equal intelligence. In making such a comparison it must be borne in mind that the crop of one needs no manure, requires no care during its period of growth and after it has once been planted, and that it is harvested by simply taking it from the water in which it dwells. It is almost wholly profit. The other must not merely be planted, but must be fertilized at great expense and worked and cultivated with assiduous labor of man and beast, and finally, when at last successfully harvested and saved from destruction through disease, insects, and the elements, it yields but a meager advance upon the cost of time and trouble.

It has been the habit to cultivate the land and neglect the

water; the one has been reduced to a private ownership and constitutes a large part of individual wealth, while the other is a sort of common property too little appreciated to be reduced to possession where this is possible, and abandoned as a sort of waste to yield what it may without care to the few chance persons who make a living out of it. We have tilled the ground four thousand years; we have just begun to till the water.

Fish can be raised with less trouble and cost than any other article of food. The lakes and rivers are full of animal and vegetable life upon which fish can live, now wasted, but which should be utilized by stocking these waters with suitable varieties. There is not only an abundance of food, but it is also true that fish need less food to produce a given amount of flesh than is required by birds or land animals. The amount which will make a pound of poultry or beef will make many pounds of fish. This is owing to the fact that they are cold-blooded and usually inactive animals. When we see them in the water they are in motion because they see us. At times they go long distances in search of breeding spots, but they are, as a rule, quite torpid in their habits. Animal action consumes the system. For this reason those who wish to fatten cattle or poultry keep them confined. Animal heat is also a great consumer of food, and a large share of all that is eaten by warm-blooded animals is needed to maintain this vital heat. As fish are cold-blooded, they need but little food for this purpose, and most that they take goes to make bulk and weight. The fact that this class of animals will live a long time without eating anything is familiar to all. There is but little waste of their systems in any way. We frequently see birds and fishes kept in the same rooms. While the first are restless and need constant care and feeding and frequent cleaning of their cages, the latter are almost motionless, unless disturbed, and as the water in which they are kept is usually clear and fresh, it has in it but little food.

It may be true that a pound of fish does not contain as much nourishment as a pound of beef, but the difference is by no means as great as the difference in the cost of production. For some purposes of health it is much more valuable than a like weight of other food. Less care and labor are needed to raise fish than to raise other animals, or even to raise vegetables.

We must give close attention to our flocks and herds throughout the year, and we must toil through a long season to make vegetables grow. Lakes and rivers are well said to be like fields prepared for seed.

Fish only need our help in one way. At breeding times their eggs are mostly destroyed by numerous enemies and but few are

hatched. By artificial means, at a trifling cost, nearly all the eggs can be saved and vast numbers of young produced.

It is a curious fact that the stomachs of fish are so often found to be entirely empty of food, and the migratory varieties seem hardly to feed at all while preparing to spawn. This would imply either that they digest very rapidly or can go a long time without nutriment, and probably both of these deductions are true. Heat and motion are the main consumers of food, for animal bodies are physically machines which must be supplied with fuel if motion is to be generated, and will wear out with friction unless the waste is restored. A man or a horse can only perform his share of work if his thoroughly nourished; and, on the other hand, neither needs nor can digest his full amount of food unless he works. The terrestrial animals are warm-blooded and active, many of them in their natural state getting their food by the chase, whereas fish are cold-blooded, and, although occasionally making long journeys, are ordinarily quiet.

The culture of fish has been gradually extended from one species to another until we have a fair idea of what can be done in all cases, and those even who try new experiments have much to guide them and can, up to a certain point, tread with assured footsteps.

The following points upon fish culture seem to be established:

1. Fish culture, extending to every variety of fish, is entirely practicable.

2. It may, under proper management, be made profitable to the producer, as much so or more than the cultivation of the land, or of land animals, and on similar conditions.

3. It may furnish to all classes an abundance of cheap and most nutritious and healthful food.

4. It is absolutely necessary in order to the preservation of the fish of the country from total destruction.

5. Every section of our country, and all its creeks, rivers, lakes, and sea coasts are available for this, care being taken that the right kinds of fish are selected for the waters into which they are placed, observing latitude, climate, temperature, and quality of water.

6. It may be carried on by stocking waters with young fry brought from hatching establishments, or by obtaining eggs for hatching, and both eggs and young fish may be transported safely to almost any distance.

7. The money capital required for these operations is small, skill, care, patience, perseverance, and common sense, the same as in any other business, being the chief requisites.

8. Individual enterprise is alone sufficient for success, though State action is desirable; indeed, legislation is essential, if not to foster, at least to protect those engaged in the business of fish culture.

We also wish to present to our readers a few facts in regard to fish breeding from some of the leading packers and fishermen on the Fraser river in British Columbia.

The following letters from reliable sources are herewith given in evidence of some of the benefits which have been experienced from the planting of fry in certain localities, which were bred in the hatcheries:

NEW WESTMINSTER, B. C., August 23, 1889.

SIR: At a meeting of the board of trade, held last night, the following resolution was unanimously carried:

That this board of trade has every reason to believe that the Fraser river hatchery has been productive of much good, and the experience of this and last season proves beyond doubt that the numbers of fish coming into this river has greatly increased; therefore, this board is of the opinion that it would be mistaken economy to close said hatchery, and that the fishing interests of the Province are such as to make it desirable that the efficiency of the hatchery should be increased rather than decreased, and that an additional hatchery should be established at Harrison river, or some other suitable point.

Yours, truly,

D. ROBSON, Secretary.

[Extract.]

NEW WESTMINSTER, B. C., Aug. 7, 1889.

In regard to the Fraser river hatchery I think I am able to speak more correctly on this work than any fisherman on the river. For over thirty years I have fished salmon on the river, and therefore know what should be expected from the various years as they came along. Last year and this I have caught many more spring salmon than ever before, and very many of these fish were under the usual size, a fact which convinced me that they are a product of the hatchery. My thirty years' experience teaches me that the large number of these small fish is not the result of accident.

The unprecedented run of "sockeyes" this year brings with it a phenomenon never before observed on the Fraser river, viz.: a great run of "sockeyes," averaging from $3\frac{1}{2}$ to $4\frac{1}{2}$ pounds in weight each. This has never happened before in my thirty years' experience, and I attribute it solely to the work of the hatchery. Last year there was a small run of these fish also. On the whole I consider the hatchery a very important factor in maintaining the fisheries of the Fraser, and the removal of the hatchery, in my opinion, would be a general calamity. I trust the fisheries department will do nothing rashly in this matter, and in conclusion I would urge a strict maintenance of the efficiency now prevailing.

I am, sir, your obedient servant, WM. H. VINCENT.

LADNER'S LANDING, August 19, 1889.

SIR: Replying to your letter asking for my opinion regarding the utility of the hatchery, I would state that it is favorable. The fact that fish have been propagated in rivers to which they were previously unknown is evidence that their numbers may, by similar methods, be increased in their native waters. This has actually been done at Rogue river, Oregon, where Mr. R. D. Hume erected a salmon cannery and a hatchery some twelve years ago. The hatchery, since its establishment, has increased the supply of salmon three-fold.

I believe further that the hatchery under your supervision on this (Fraser) river has been of great benefit this year. The "sockeye" run is not ended, yet there are already more fish packed on the Fraser than were ever before put up in the whole Province during an entire season. Each and every cannery on the river has exceeded its greatest previous packs made on this run. The increased number of canneries this year partially accounts for the large aggregate output, but not for the uniformly greater pack of individual canneries.

To discontinue work at the hatchery would be a mistake which the Province cannot afford to make.

Yours truly,

E. A. WADHAMS.

CANOE PASS, August 15, 1889.

DEAR SIR: I am in receipt of yours of the 12th instant, and in answer would say that in the matter of the hatchery it is my firm opinion that the big run of salmon this year is to be attributed to a great extent from the output of the hatchery, and it is to be hoped that the government, instead of curtailing the expenses on the existing one, will establish another in some suitable place on the Fraser river. The salmon industry on this river has been a great success and a great source of revenue to the Province this year, and will always continue to be so as long as it is fostered and protected by the government.

How anyone (unless it could be through prejudice) can say but that the great sources of fish supply this season can be attributed to any cause outside the hatchery I cannot see. You can take, for instance, the supply of salmon for the year 1885, when there were only six canneries running, and it did not nearly average to each boat as much as they did this, with sixteen canneries running.

I would strongly recommend that the hatchery should be continued, and for the next three years let it prove its value, and I think it will convince the most bitterly prejudiced of these parties that write against it. I might quote instances of the great success of

hatcheries, such as Rogue river, and also the hatchery of shad on this coast; but you, of course, are thoroughly conversant on these subjects, and I will not occupy your time in doing so.

I will conclude by strongly recommending that the hatchery be continued.

Yours very truly,

THOS. E. LADNER.

CANOE PASS, B. C., Aug. 15, 1889.

In answer to yours, *re* hatchery on Fraser river, beg to state that, judging by the results this year, my opinion is that the salmon hatchery established on the Fraser river has increased the salmon run enormously.

I have the honor to be, sir, your obedient servant,

D. DRYSDALE,

Manager Canoe Pass Canning Co.

The above letters are quoted from the report of the department of fisheries, Dominion of Canada, for the year 1889.

We might go on and copy testimonials from such men as Laidlaw & Co., M. M. English, Peter Burrell, D. T. Mann, Finlay, Durham & Brodie, all of whom are prominent salmon packers on the Fraser river, and are well known to many of us Oregonians as reliable men, but we do not wish to tire our readers, but simply to impress upon their minds the great importance of this work and the incalculable benefits which may be derived therefrom. We most respectfully ask you to read carefully page 4 of our report for 1888 and 1889, in reference to what other States are doing in the way of fish culture, and the returns received therefrom, and compare them with Oregon.

The increased catch of salmon in the Columbia river during the season of 1890 was a surprise to all, and, as we have already said in this report, at least a part of this increase is due to propagation.

A few of the packers have written us letters giving their views in regard to the effects of the hatchery on the run of salmon in the Columbia river the past season, which we present with and make a part of this report.

PORTLAND, OREGON, Nov. 29, 1889.

Mr. F. C. Reed, President of the Oregon Fish Commission:

DEAR SIR: We wish to congratulate you upon the success of this season's operations at the Clackamas hatchery. The number of eggs taken (6,000,000) was in excess of the expectations of the delay in putting in the rack last summer, and the unusual large catches of the fishermen who operate on the Clackamas below the hatchery. This season has shown the advisability of closing the

Clackamas against all fishing for commerce and keeping the fish that ascend this stream solely for the hatchery. If this could be done, there is little doubt but that 20,000,000 eggs could be taken annually at the Clackamas station.

A member of this firm visited the branch hatchery at Warrendale some time since, and found the eggs and young fish doing well under the careful supervision of Mr. Tallist. We think well of sending some of the eggs from the Clackamas to this place, to be hatched and put into the Columbia.

Respectfully,

BUSHHIRT PACKING CO.

ASTORIA, OREGON, Nov. 26, 1890.

Hon. F. C. Reed, Chairman Oregon Fish Commission:

DEAR SIR: Referring to your inquiry regarding the effects of propagating salmon on the Clackamas river, I am frank to acknowledge that the extra supply of salmon caught in the Columbia river during the past season of 1890, was due to propagation on the Clackamas in the year of 1887. This being the third season, I did not look for as much benefit as there was, but the coming season, which will be the fourth year, I look for much better results. The enterprise is a good thing for this part of the coast and partly fills a long felt want. I hope that in the near future we can interest our representatives enough on this subject to get further aid. Both Oregon and Washington should legislate for the protection and propagation of salmon.

Yours, respectfully,

J. O. HANTHORN,

Manager J. O. Hanthorn & Co.

ASTORIA, OREGON, Nov. 26, 1890.

Hon. F. C. Reed, President Oregon Fish Commission:

DEAR SIR: Referring to your request for our opinion as to the results arising from the artificial propagation of salmon, we have this to say: We believe the generally accepted theory to be that returns may be expected on the fourth year following the hatching of the young fry, according to which the first returns, or the returns from the first season's propagation, would not be due until next season, 1891. But we are firmly convinced that the unusual run of fish that we had in April and May of the season just passed was due to the return of three-year-old fish, from the first season's propagation. This opinion is caused not only by the unusually large quantities of fish in the river at that time, but by the size and general appearance of the fish as well. Such being the case, and it being fair to presume that only a small *percentage* would return on the third year, we are satisfied that the fourth (next) and subsequent seasons will

clearly demonstrate our opinion by largely increased runs. We think that it is only necessary to continue the good work to make the Columbia river inexhaustible in its supply, and we trust that both propagation and protection may be continued to that end under your well directed efforts.

Very truly yours,

GEORGE & BARKER

The pack for the Columbia river for the season of 1890 is, as nearly as can be ascertained, 452,925 cases, or, in round numbers, 453,000 cases, or 21,744,000 pounds, which is an increase over the season of 1889 of 122,000 cases, and, had the season of 1890 started up under as favorable circumstances as the preceding one, the increase would have been much greater.

On the first of April, which is the usual time for the canneries to begin operations, there arose a difference between the packers and the fishermen's union as to the price of raw fish, the fishermen asking the same as they received in 1889, viz., \$1.25 per fish, while the packers claimed this was more than they could pay, as the market for canned goods was very poor, and no contracts could be made for future delivery which would justify them in paying this price for fish. This state of affairs continued until about the tenth of May, with the exception of three canneries, one at Astoria, Oregon, and two at Eagle Cliff, Washington. These started up in April and secured their fish from quite a number of non-union men who were fishing along the river from Eagle Cliff up to the mouth of the Willamette, and also obtained many fish from the Portland markets, which came from the Clackamas and Willamette rivers. These fish cost the packers 3 cents per pound, with freight added, which would make the cost of the raw material, delivered at the canneries, $3\frac{1}{4}$ cents per pound, or an average of 75 cents per fish, which price all of the packers were willing to pay at the opening of the season, and frequently made that offer to the fishermen. This state of affairs continued, as before stated, till about the tenth of May, when a compromise was made by the packers paying \$1 each for fish.

About this time twenty of the packing establishments on the river began operations on a limited scale and continued till about the 5th of June, when they again closed their doors and refused to take any more fish except at 75 cents each, or 3 cents per pound. On the eighth of that month the fishermen acceded to the terms of the packers and went to fishing for 75 cents per fish, or 3 cents per pound. From this time the business continued until the close of the season, but at no time during the season was it carried on to its full capacity. If the price of raw fish had been satisfactorily settled in March, so that the packers could have been prepared with

cans and a full complement of men to begin work on April 1st, the pack on the river would have been at least 100,000 cases more.

The amount of gear used in taking fish the past season will not vary much from the amount given in our last report, about the only changes being a reduction in the number of gill-nets of about 300, and a small increase in the number of pound-nets; seines, slat-traps and fish-wheels remaining about the same.

As to the financial result of this season's pack, we think it has been the most satisfactory to both fishermen and packers of any they have had for the past five years. The fishermen all made good wages during the time they were at work, and the packers nearly all made small interest on their investment.

Now let us consider for a few moments the difference between a good run of fish, as we have had this season, and a poor run, such as we had in 1889, and see which is best for the industry and for the people at large: During the season of 1889 the fishermen received \$1.25 per fish, and the average catch per boat did not exceed 500 fish, which, at \$1.25 per fish, would amount to \$625. Divide this between two men and we have \$312.50 each for four months' work, or \$78.12½ per month. During the season of 1890 the fishermen received for three weeks of the season \$1 per fish, and for eight weeks 75 cents per fish, or for the eleven weeks 80 cents per fish; and the average catch per boat was about 800 fish, which, at 80 cents each, would be \$640, or \$320 for each man for less than three months' work, or \$106 per month, showing a difference in favor of the fishermen of \$27.87 per month on a good run as compared with a poor run. And any of the fishermen will say they did not have to work as hard for \$106 per month in 1890 as they did for \$78.12½ per month in 1889.

Now we will look at the packers' side of the question: In '89 the raw fish delivered on the wharf cost the packers on an average \$4.05 per case; add to this the cost of packing, say \$2.25 per case, and we find the canned goods ready for market cost \$6.30 per case. The average price obtained was \$6.50 per case, which would leave a profit of 20 cents per case. In '90 the raw fish delivered on the wharf cost the packers on an average \$2.40 per case; add to this the cost of packing, \$2.25 per case, and we find the cost of the goods ready for market to be \$4.65 per case. The average price obtained by the packers was \$5 per case, leaving a profit of 35 cents per case, making a difference in favor of a good run of fish of 15 cents per case; and, as all know who are familiar with the canning business, a large pack can be put up at a less cost per case than a small one; for instance, the wages of a superintendent, book-keeper, foreman and fireman are the same on a pack of 10,000 cases as they would be on one of 20,000 cases.

Let us see how it is with the consumer: Taking the above figures, in '89 canned salmon cost the consumer $13\frac{1}{2}$ cents per can. In '90 the cost of the same article to the consumer (providing the middlemen's profits were the same each year) was $10\frac{1}{2}$ cents per can, or a difference to the consumer of 3 cents per can in favor of the good run of fish. If we take an average pack, of say 450,000 cases, and multiply the total number of cans by three, we find the consumers have paid the enormous sum of \$648,000 more for their goods in a year when there was a poor run of fish than they did in a year with a good run.

Now we have shown conclusively, we think, that neither the fishermen nor the packers have been benefited by this extra cost to the consumers. When any good article of food becomes cheap there is a much larger quantity of it consumed than when it is dear. Now we claim that the Columbia river is capable of producing more than 1,000,000 cases, or 48,000,000 pounds of canned salmon per year, still having a good supply for our home markets, fresh, if a sufficient amount of young fish are yearly planted in its waters. It will not do to plant a few for a year or two and then stop until they are exhausted before planting again. Can a farmer harvest a good crop of grain from a piece of land for five or ten successive years by sowing only once or twice during that time? The answer must be *no*. Why, then, should we expect to reap a harvest from the water, year after year, if we do not plant or sow? We may do this for a few years, but in time we shall find that nature is unable to supply the greed of man unless he lends her some assistance.

Some have argued that all fishing should be stopped in our waters for four or five years, and then the fish would be as plenty as ever they were. Let any one who has come to the years of understanding draw a picture of this in his own mind and see how it would look.

Here we have an industry that is worth to the State of Oregon on an average \$2,500,000 per year, and can be made to yield that amount yearly for many years to come by the expenditure of one-half of 1 per cent per annum on this amount. If we stop all fishing, say for four or five years, the State will have lost during that time the sum of \$12,500,000, and saved one-half of 1 per cent interest on \$2,500,000, or \$62,000. Could any one with the interest of the great State of Oregon at heart recommend the passage of a law to stop all fishing for salmon in our waters for this period of time at such a loss to our State; or would they recommend the appropriation of the small amount mentioned to advance and build up this industry, so that at the end of five years it will return to the State \$5,000,000 yearly instead of \$2,500,000?

OPERATIONS AND RESULTS OF THE LAW.

About all we have to say under this head is to ask that our last report be carefully read and considered; and in addition thereto we wish to inform you that the same trouble has attended our labors in regard to enforcing the law the past season on the Columbia river that has prevailed for some years on the Delaware river, the Columbia, as the Delaware, being the dividing line between two States. This state of affairs we endeavored to remedy by having similar laws passed by both States. In order to do this, we recommended to the Washington legislature at its last regular session the passage of the same bill which was passed by our legislature in 1889. They complied with our request in so far as the Columbia river is concerned, and the only thing needed now is for the Oregon legislature, at its coming session, to cooperate with that of Washington, and pass senate bill No. 135, notwithstanding your objections.

There were five arrests made for fishing with gill-nets on Saturday nights, four of which paid fines and were discharged; one, having caught no fish, could not be held under our present law.

We recommend the passage of senate bill No. 135 and house bill No. 218, which passed the legislature at its last session and were vetoed by you, and in lieu of the bill appropriating the sum of \$6,000, which was also vetoed, we recommend an appropriation of \$25,000, for the purpose of erecting and maintaining one or more State hatcheries for the ensuing two years; and if house bill No. 218 becomes a law, in our opinion the State will not need to make further appropriations for this industry. Also, that a law be enacted prohibiting the use of spears, or hooks on poles, for taking fish in any of the waters of this State, with a suitable penalty attached. Also, an act compelling the owner or owners of all irrigating and mining ditches to put screens of fine wire netting across the mouth of all such ditches, to remain there during the months of April, May, and June. Also, an act giving the fish commission power to determine what are obstructions to the passage of migratory fish; also, to decide what are suitable fishways, and compel the owners of all artificial obstructions to provide them with such openings when needed.

We would recommend that a law be passed compelling the owners or builders of pound nets in the Columbia river to have all the piles or stakes that may be used by them during any fishing season hereafter pulled up by the first day of September of each year; provided, however, that they may, if they see fit, leave standing one stake for each trap, known as the king stake.

METHODS OF FISHING.

These remain the same as in former reports, with no probability of any marked change for years to come.

HATCHERIES.

Under this head we are pleased to report that the feeling in favor of hatcheries and the propagation of fish is growing stronger from year to year, and during the past year this feeling has been more marked than in any preceding one, as many who have heretofore scoffed at the idea of raising fish are now convinced that the propagation of fish is a success and can be made to give a wonderful increase for a small outlay, and are anxious that no reasonable expense should be spared to bring about this result. A part of this, at least, we think is due to the Oregon commission, also we give to the United States commission all deserving credit, and think that much better results can be obtained by the State and United States commissions joining hands in this great work, as is done in all the States that have a commission. This has been our aim since the United States commission took hold of the Clackamas station, and only once has there been any disagreement between us. This occurred during the season of 1889, in regard to taking eggs from Clackamas station to Fort Gastion, California. As soon as we heard such a demand had been made we immediately wrote to United States Commissioner McDonald and requested him to countermand his order, as it was our agreement with the United States commission, when we gave up the Clackamas station to them, that all the eggs taken at that station should be hatched and distributed in Oregon waters, until we had received some benefit therefrom, and when he saw the advantage of this to both the United States and State commissions he willingly withdrew his order and no eggs left the State. A few words in regard to the work of the United States commission at the Clackamas station may not be out of place here. The results of their work at this station for the season of 1889, as given in our last report, can be fully verified. The work there for the season of 1890 will, contrary to the expectations of all, exceed anything that has ever been done there, as by latest reports from the station we are advised that they have already secured more than 6,000,000 eggs and may swell the amount to nearly 7,000,000.

We did not exhibit any eggs at the industrial fair this year, partially from the fact that we could not get them soon enough to have them hatching while on exhibition, and we had no assurance of any better water supply than we had in 1889, when they killed them with hot water; we also lacked time to attend to them.

As stated before, we have refitted the station at Warrendale and taken 800,000 eggs from the Clackamas station to be hatched there and put in the Columbia river. In conclusion, under this head, we trust you will, in your message to the legislature, recommend that liberal appropriations be made for this great work, and that the legislators will look upon this as one of the State's greatest industries, and in all their acts in reference thereto they may be liberal and open-hearted, and thereby secure the good will of generations to come.

EXPENSES INCURRED.

Date.	Name.	On what account.	Amount.
November 30, 1889.		Previously reported.....	\$ 1,925 00
January 3, 1890.....	F. C. Reed.....	Salary.....	500 00
January 3, 1890.....	F. C. Reed.....	Reimbursement.....	331 50
January 3, 1890.....	Honeyman & DeHart.....	Hatchery expense.....	14 60
January 3, 1890.....	M. Pomeroy.....	Labor.....	55 00
January 3, 1890.....	R. C. Campbell.....	Expenses.....	164 00
January 3, 1890.....	E. P. Thompson.....	Salary.....	50 00
January 4, 1890.....	Goldsmith & Lowenberg.....	For hatchery.....	40 46
January 13, 1890.....	Nicolai Bros.....	For hatchery.....	19 92
January 20, 1890.....	Dean Blanchard.....	Lumber for hatchery.....	22 00
April 1, 1890.....	F. C. Reed.....	Salary.....	500 00
April 1, 1890.....	F. C. Reed.....	Reimbursement.....	25 00
April 1, 1890.....	R. C. Campbell.....	Salary.....	50 00
July 2, 1890.....	F. C. Reed.....	Salary.....	500 00
July 2, 1890.....	F. C. Reed.....	Reimbursement.....	47 75
July 2, 1890.....	R. C. Campbell.....	Salary.....	100 00
July 2, 1890.....	E. P. Thompson.....	Salary.....	100 00
September 10, 1890.....	F. C. Reed.....	Reimbursement.....	132 00
September 17, 1890.....	R. C. Campbell.....	Expenses.....	148 25
October 6, 1890.....	F. C. Reed.....	Salary.....	500 00
October 6, 1890.....	F. C. Reed.....	Reimbursement.....	149 20
October 10, 1890.....	R. C. Campbell.....	Salary.....	100 00
October 13, 1890.....	E. P. Thompson.....	Salary.....	100 00
Total.....			\$ 5,574 68

HATCHERY EXPENSES.

Up to November 30 we have paid M. Pomeroy for labor in refitting the station at Warrendale \$24.50. Estimated expenses of hatchery and salaries to January 1, 1891, \$850. We still have on hand \$5,155.60, the amount we received from the United States commission for the transfer of the Clackamas station, and had the bill passed by the last legislature appropriating \$6,000 become a law we could, by putting the two amounts together, have erected and operated a small station on the Upper Clackamas during the past year to good advantage. But as the amount we have on hand is far too small with which to begin operations we will return it to the State Treasurer, and recommend that an appropriation of twenty-five thousand dollars be made by the coming legislature, so that the commission can erect and operate a station on the Willowa and also on the Upper Clackamas.

STATISTICS

Of the Salmon Fishing Industry of the State.

The pack for the Columbia river in Oregon, and other streams wholly within the State, for the season of 1890, as near as can be obtained, is as follows:

Name of River.	No. of Cases.
Columbia river, spring pack	285,000
Columbia river, fall pack	
Nehalem river, fall pack	9,000
Tillamook river, fall pack	14,009
Rogue river, spring pack	16,000
Rogue river, fall pack	8,000
Cases	332,000
Or pounds	15,936,000
Add to this the number of cases packed on the Washington side of the river, 167,000 cases, and we have a total number of cases	499,000
Or total of pounds	23,952,000

In comparing the above pack with that in our last report for the season of 1889, it will be seen that, notwithstanding the pack for 1890 exceeds that of 1889 by 72,200 cases, there were no fish packed in 1890 on the following streams: Nestucca, Yaquina, Alsea, Siuslaw, Umpqua, Coquille, or Coos Bay, while in 1889 these streams packed 60,700 cases. The reason none were packed in these streams this year may be attributed simply to an over-supply at high prices. The Alaska pack, which was very large in 1889, comes directly into competition with the pack on our coast streams, being of about the same quality, the Alaska having some advantage in the color of the fish, which makes them sell more readily; and, strange to say, packers can go to Alaska, a distance of 1,500 or 2,000 miles, and pack salmon and put them in the market at a less price than they can from our coast streams, because they get the raw fish so much cheaper.

The amount of salmon that has been used fresh in our home markets and shipped East during the season will reach 4,500,000 pounds; consumed by the Indians and resident fishermen, 2,500,000 pounds. In summing this all up we find we have taken from the waters of the Columbia river and other streams in Oregon, during only eight months of the year, 30,952,000 pounds of salmon, or, in round numbers, 31,000,000 pounds, leaving out all other kinds of fish.

Now let us compare the products of the water with those of the land. These 31,000,000 pounds of fish at 10 cents per pound would amount to \$3,100,000, and they have been taken from about 200,000 acres of water, which is less than 1-300 of the total acreage of Oregon. If the whole sixty millions of acres in Oregon produced

at the same rate, and the products sold at the same price, it would amount to more than nine hundred millions of dollars annually. Or, again, we will say Oregon has 3,000,000 acres of land under cultivation; in order to reach the same results each acre must bring forth \$300 worth of produce.

The lamented Seth Green put it very mildly when he said "one acre of water will produce as much as five acres of land," for one acre of Oregon waters will produce more than ten acres of land; if the water was cultivated with the same perseverance as the land is it would double the above.

Whenever the State has been asked to appropriate a small amount of money for the purpose of increasing, and thereby cheapening, its supply of food fish by propagation and planting them, the question has been asked by some, "why should not the State supply the farmers with seed to use upon their farms, as well as to supply the waters with young fish?"

Now, while we may not answer this to the satisfaction of all, we will endeavor to make it plain enough for the average business man's brain to compass. The waters of the State are public property, and in consequence the fish within these waters must be public property, and as such a farmer or any other person from any part of the State may come and take all he needs and no one can dispute his right. How is it with the farmer's produce? Are the fishermen and all others allowed to go into the farmer's granary and take away what he may need for the winter, or into his potato-bin and take a winter's supply of potatoes, or into his herds and take a fat steer or sheep when he likes? No, the farmer is sole owner of his land and all that grows thereon, and is at liberty to cultivate it and use the products thereof for his own comfort and benefit.

How is it with the fisherman or the man who gets his living out of the water? Can he mark off 640 acres of the State's water and say this and all that it contains is mine? Certainly not. How then can you expect him to cultivate that 640 acres by planting it with fish when he has no more right to catch them than the farmer. Therefore, we think it is plain that the appropriation of State money for fish culture is the same as appropriating it for any other public improvement.

We appropriate money to build wagon roads in certain parts of the State, and yet many of its citizens never take a step on one of these roads that his money has helped to build, and yet he derives a certain indirect benefit from them. The State appropriates money to build prisons and asylums for those who are so unfortunate as to become insane or blind, and you will not find a person within its

borders who will tell you he is going to occupy any of them. Why, then, are we taxed to build and support them? Simply because it is for the good of the public. It is the same in appropriating money for fish culture, with this exception, all money appropriated for this purpose is a safe investment and sure to be returned with good interest.

As will be seen from the following statistics the good results from fish culture on the Fraser river still continue, as the pack there is as large as that of 1889, a thing hitherto unknown in the history of this river to put up such an enormous pack for two years in succession.

RECAPITULATION

Of the Salmon Industry of Oregon and the Pacific Slope.

Name of Place.	Number of Cases.	Value.
Columbia river and streams wholly within the State -----	499,000	\$ 2,395,200
Streams in Washington -----	7,000,000	560,000
California -----	15,000	60,000
Alaska -----	40,000	200,000
	650,000	2,437,500
Total for United States -----	1,204,000	\$ 5,652,700
Fraser river, B. C. -----	320,000	1,680,000
Other streams in British Columbia -----	100,000 } --	
Grand total -----	1,624,000	\$ 7,332,700

While this shows a decrease in the entire coast pack from last year of only 59,800 cases, it shows a falling off in value of \$1,831,300, nearly all of which may be attributed to the increased pack on the Columbia river.

The other varieties of fish caught and their value, as near as we have been able to obtain, are as follows:

Name.	Amount.	Value.
Sturgeon -----	1,155 tons	\$ 115,500
Caviar of sturgeon -----	18 "	3,600
Shad -----	10 "	2,000
Smelt -----	30 "	4,800
Tom cod -----	5 "	500
Sardines -----	5 "	500
Total -----	1,217 tons	\$ 126,900

As will be seen by comparing this with our last report, our fishing industry outside of salmon is becoming of more importance every year, the increase in the quantity of sturgeon being the greatest.

The catch of shad fell off from that of last year to quite an extent, owing, we think, to the early freshet in the river, which was highest about the middle of May; and the water being very muddy and remaining so for a longer time than usual, the shad did not come in so plentifully as they did in former years, as they are a fish that like as much clear water as possible.

We believe that sardine fishing in the Columbia river will become an important industry before many years, for to all appearances they are equally as good as the genuine French sardine, and when packed by competent and experienced packers they will take the place in our markets of the imported article.

Our deep-sea or salt-water fishing is still carried on by the Pacific Deep Sea Fishing Company of Portland, and with very good success. Though they employ but one vessel as yet, we have been assured by them that they do not intend that the demand shall ever be greater than the supply, as they are ready to increase the latter at any time when the former requires it; and, as the country west of the Rockies becomes settled and transportation lines are extended to its different parts, the waters of the Pacific coast are able to supply them all with good, wholesome and cheap food.

In closing our report we do not wish to forget the courtesies shown us by our different lines of railroad the past year, as they have been willing at all times to accommodate us in transporting eggs and other freight in connection with the fish industry, even at their own inconvenience.

To the press of the State we desire to extend our hand and thanks for the loyal manner in which it has stood by us during the year, and the new interest being taken by it in one of the most important industries of the State.

GENERAL FISHING LAWS OF OREGON.

RELATING TO OYSTERS.

Section 3846. No person not a citizen of the United States, or competent to become such under the laws of congress, and actually domiciled within the State, and subject to State and county taxes, shall gather oysters in natural beds, for sale or transportation or for replanting, nor shall own any artificial oyster-bed or any interest therein; nor shall any person purchase oysters for transportation or replanting, except from persons so qualified.

SEPT. 27, 1862. §1
Who privileged
to take oysters.

Section 3845. No persons shall remove oysters from natural beds between the fifteenth day of June and the tenth day of September in any year; *provided*, that nothing in this chapter shall be so construed as to prevent any person owning artificial beds from taking oysters from said beds at any time.

OCT. 21, 1864.
Oysters, when
they may be re-
moved from
natural beds.

Same as to ar-
tificial beds.

Section 3844. The natural beds of oysters on the waters of this State shall be free to all citizens thereof who shall have resided in this State one year, and shall have been residents of the county where such beds are located for a period of six months immediately preceding the time of taking such oysters; but artificial plantations of oysters belonging to citizens of this State, if distinctly marked out by means which shall not obstruct navigation, and not exceeding the extent allowed by local regulations, shall be deemed and protected as private property; and the following portions of Yaquina Bay, in Benton county, are hereby designated and set apart for artificial plantations of oysters, to-wit: Brown's Flat, Pool's Slough, Lyman's Eddy, and Green Point; and the size and dimensions of said oyster-beds shall remain as they have been fixed by the local regulations of the oystermen's association, not exceeding two acres in any one plantation; and every person holding a claim for the

OCT. 29, 1870.
Natural oyster
beds free to cit-
izens of this
State.

Artificial beds
private prop-
erty.

Private bedson
Yaquina bay.

OCT. 29, 1870. Same subject. cultivation of oysters shall in all respects comply with the local regulations applicable thereto.

OCT. 19, 1876. §1 Persons taking oysters not to commit waste, scoop, scrape, drag or dredge where the water is of a less depth than twenty-four feet at low tide; nor shall any person gathering oysters from natural or artificial beds commit or permit waste by casting young oysters or shells on shore or in places unfavorable to their growth or increase.

OCT. 29, 1870. §1 Violating act relating to oysters. Section 1951 [701]. Every person who shall be guilty of violating any provision of sections 3844, 3845, 3846 and 3847 shall, on conviction thereof, be fined in any sum not exceeding one thousand dollars for every such offense.

KILLING FISH WITH EXPLOSIVES.

OCT. 17, 1872. §6 Killing fish with explosives. Section 1948 [697]. It shall be unlawful for any person or persons, at any time, to place or use, in any of the streams or rivers of this State, any drugs, charms or powder, or to use any giant, blasting or gun powder, or other explosive material, for the purpose of catching, killing or destroying fish; and any person violating the provisions of this section shall be fined twenty dollars for the first offense, double that sum for the second, and treble that sum for each succeeding offense, to which may be added imprisonment for any time not exceeding ninety days.

Id. §7. Catching fish with drugs. Section 1949 [698]. It shall be unlawful for any person or persons to place in any fresh water stream, lake or pond, any lime or deleterious substance with intent to injure fish, or any drug or medicated bait with intent to poison or catch fish; and any person offending against the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than one hundred dollars, and not more than five hundred dollars, or be imprisoned not less than five nor more than ninety days, at the discretion of the court.

OCT. 16, 1878. §1. Laws of 1878 p. 21. Obstructing migration of fish in streams. Section 1950 [700]. Any person or corporation who shall hereafter construct any dam or other obstruction across any stream of this State, in which salmon or other migrating fish run, shall provide a ladder or way, so as to permit such fish to pass such dam or other obstruction; and any offending against the provisions of this

section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not less than fifty nor more than five hundred dollars; *provided*, that the provisions of this section shall not be construed to apply to any person or corporation duly organized for the purpose of propagating salmon or other fish in any of the streams of this State.

OCT. 16, 1878.
Same subject.

Section 3489. It shall not be lawful to take or fish for salmon in the Columbia river or its tributaries, by any means whatever, in any year hereafter during the months of March, August and September; nor at the weekly close times in the months of April, May, June and July—that is to say, between the hours of six o'clock in the afternoon of each and every Saturday until six o'clock in the afternoon of Sunday following; and any person or persons catching salmon in violation of the provisions of this section, or purchasing salmon so unlawfully caught, shall, upon conviction thereof, be fined in a sum of not less than five hundred dollars nor more than one thousand dollars for the first offense, and for each and every subsequent offense, upon conviction thereof, shall be fined not less than one thousand dollars, to which may be added, at the discretion of the court, imprisonment in the county jail for a term not exceeding one year.

OCT. 16, 1878. 29.
Season of fishing for salmon.
St. 1878, p. 12.

Penalty.

Section 3490. It shall not be lawful to fish for salmon in the Columbia river or its tributaries during the said months of April, May, June, and July with gill-nets, the meshes of which are less than four and one-eighth inches square, nor with seines whose meshes are less than three inches square, nor with weir or fish traps whose slats are less than two and one-half inches apart. Nothing herein contained shall prevent fishing in said river or its tributaries with dip-nets during the fishing season, as established and defined by section 3489. Every trap or weir shall have in that part thereof where the fish are usually taken an opening at least one foot wide, extending upwards from the bottom towards the top of the weir or trap five feet, and the netting, slats, and other materials used to close such aperture, while fishing, shall be taken out, carried upon shore and there remain during the said months of March, August, and September, and the weekly close time in the months of April, May, June, and July, as prescribed in section 3489, to the intent that during said close time the salmon may have free and unob-

OCT. 16, 1878. 22.
What seines and nets may not be used.

Traps and weirs, how to be constructed.

OCT. 16, 1878. 22
Same subject.

Penalty for violation.

structed passage through such weir, trap, or other structure, and no contrivance shall be placed in any part of such structure which shall tend to hinder such fish. In case the inclosure where the fish are taken is furnished with a board floor, an opening extending from the floor five feet towards the top of the weir or trap shall be equivalent to extending the said opening from bottom to top. Any person or persons violating the provisions of this section, or encouraging its violation by knowingly purchasing salmon so unlawfully caught, shall be deemed guilty of misdemeanor, and, upon conviction thereof, shall be fined for the first offense not less than five hundred dollars, nor more than one thousand dollars, and for each subsequent offense shall, on conviction, be fined not less than one thousand dollars, to which may be added imprisonment in the county jail for a term not exceeding one year.

OCT. 16, 1878. 23
Informers to have half of the penalty.

Section 3491. The person or persons making complaint of any violations of the provisions of this Act shall, upon conviction of the offender, be entitled to one-half the fine recovered; and any prosecuting attorney who shall, upon complaint being made to him of the violation of this Act, fail to prosecute the party accused, shall be deemed guilty of a misdemeanor in office, and, upon conviction thereof, shall be fined in the sum of five hundred dollars for each and every offense.

Id., 24, p. 14.
This act not to interfere with the propagation of salmon.

Section 3492. This Act shall not be so construed as to interfere in any way with any establishment or enterprise for the propagation of salmon, whether by the United States government or any regularly organized company or society for that purpose, located or operated upon said Columbia river, or any of its tributaries.

Id., 25.
Sawdust not to be thrown in streams.

Section 3493. It shall be unlawful for the proprietor of any saw-mill on the Columbia river, or any of its tributaries, or any employé therein, to cast the sawdust made by such saw-mill, or suffer to permit such sawdust to be thrown or discharged in any manner into said river or its tributaries below the Cascades of the Columbia river and falls of the Willamette river. For each and every wilful violation of this section the party guilty of such violation shall be liable to a fine of fifty dollars for each and every offense, to be recovered before a justice of the peace of the proper county.

Section 3494. Any party convicted of any violation of the provisions of this law shall be sentenced to pay the fine and costs adjudged, and in default of paying or securing the payment thereof, he shall be committed to the county jail until such fine and costs shall be paid or secured, until he shall have been imprisoned one day for every two dollars of such fine and costs. But execution may at any time issue against the property of the defendant for whatever sum may be due of such fine or costs. Upon payment of such fine or costs, or the balance after deducting the commutation by imprisonment, or securing the same, the party shall be discharged.

OCT. 16, 1878. §6.
Punishment of
offenders un-
der this act,
how enforced.

All fines and penalties collected for violation of this act shall constitute a fund for the maintenance of hatching houses for the propagation of salmon, and be disbursed in accordance with the provisions of an act entitled "An act to encourage the establishment of hatching houses for the propagation of salmon in the waters of the Columbia river."

Section 3495. All fines and penalties hereby or herein imposed shall be enforced and collected as other fines and penalties; and jurisdiction to enforce such fines, not herein given to the justices' courts, shall be vested in the circuit court of the proper county.

Id., § 7, p. 15.
Same subject.

Section 3496. It shall be unlawful to catch salmon fish with net, seine or trap in any stream of water, bay, or inlet of the sea or river of this State at any season of the year between sunset on Saturday and sunset on the Sunday following of each and every week.

OCT. 25, 1880. §1
Salmon not to
be caught,
when.

Section 3497. Any person who shall violate this act, either by fishing with the means and appliances aforesaid, or hiring others to do so, shall be guilty of a misdemeanor, and be fined in any sum not less than fifty nor exceeding one hundred and fifty dollars, and by imprisonment in the county jail of the proper county not less than five days nor more than ten days.

Id., §§ 2, 3, p. 45.
Violation, pen-
alty of.

Section 3498. Justices of the peace shall have concurrent jurisdiction in such cases.

Jurisdiction.

PROTECTION OF RED FISH.

Section 1949. It shall be unlawful for any person or persons to take, kill, or destroy, or to pursue with intent to take, kill, injure or destroy any red fish or any lake trout in any of the lakes, rivers, or streams in the

OCT. 25, 1880.
§ 1, p. 27.
Protection of
fish.

OCT. 25, 1880. State of Oregon, from the 10th of August to the 31st of
 Same subject. December, inclusive, of each year. Any person violating the provisions of the preceding section shall, upon conviction thereof, be punished by a fine not less than twenty dollars nor more than fifty dollars, or by imprisonment in the county jail not less than twenty days nor more than sixty days. Justices of the peace shall have jurisdiction of all offenses against the provisions of this Act.

OCT. 20, 1882. Section 1936. Every person who shall, within the
 Unlawful tak- State of Oregon, during the months of November,
 ing of trout. December, January, February and March of any year, catch, kill, or have in possession, sell or offer for sale, any mountain or brook trout, shall be guilty of a misdemeanor. Every person who shall, within the State of Oregon, take, or attempt to take, or catch, with any seine, net, weir, or other device than hook and line, any mountain or brook trout at any time after the passage of this Act shall be guilty of a misdemeanor.

NOV. 21, 1885. Section 1945. Any person or persons who shall take,
 Laws of Special catch, kill, molest, injure, or destroy fish on any fish-
 Session 1885, p. 7 ladder, fish-way, or other structure or superstructure for
 Obstructing the passage of fish, or shall, with any seine or nets, fish-
 passage of fish traps, or other device, obstruct the free passage of fish in
 through the the channel of the approaches to said fish-ladder or way,
 fishway. or other structure or superstructure, for a distance of six
hundred feet from the approach of said ladder or way,
or within two hundred and fifty feet from the upper por-
tion of said fish-ladder or way, shall be deemed guilty of
a misdemeanor, and, upon conviction thereof, shall be
fined not less than five dollars nor more than one hun-
dred dollars for each offense; and each additional fish
after the first fish so taken, caught, killed, molested,
injured, or destroyed, shall constitute and be deemed a
new and separate offense within the provisions of this
Act; a justice of the peace shall have jurisdiction to try
all violations of this Act.

FEB. 18, 1887. Section 3482. There shall be chosen biennially by the
 Fish commis- legislative assembly of the State of Oregon three com-
 sioners to be petent persons, who shall be denominated the fish com-
 chosen by the mission, whose term of office shall continue two years,
 legislative as- and until their successors be chosen and qualified.
 sembly. Their terms of
 office.

Section 3483. Before entering upon his duties each member of said commission shall file with the Secretary of State a bond, with ten or more sufficient sureties, and in the sum of five thousand dollars, conditional that he will discharge his duties under this Act faithfully.

FEB. 18, 1887. §1
Their qualifications.

Section 3484. Said commissioners shall choose one of their number as chairman, and he shall be known as president of the fish commission.

FEB. 18, 1887. §3
The commissioners choose president.

Section 3485. It shall be the duty of the president to give his entire time and attention to the fishing interests of the State of Oregon, and by and with the advice of the fish commissioners see that all laws for the propagation, protection and preservation of food fishes in the public waters of the State of Oregon, whether entirely or partially within the State boundaries, are enforced; to select and purchase suitable land, build, operate and manage thereon a fish hatchery on the Columbia river, or on its tributaries, for the purpose of supplying said waters with young fish; to employ necessary and competent men to successfully carry on the said hatchery on the Columbia river, or on its tributaries; and to examine into and report upon the results of the salmon hatchery on the Rogue river.

Id., §4.
Duties of the president.

Section 3486. Said fish commission shall annually, on December 1st, report to the Governor of this State a full account of its actions under this Act; also of the operations and results of the laws pertaining to the fish industry, the methods of taking fish, the number of young fish hatched, and where distributed, amount of expenses incurred, and make suggestions as to the needs of further legislation, if any, and full statistics of the fishing business.

Id., §5.
Reports of the commissioners.

Section 3487. The president of the fish commission shall receive an annual salary of two thousand dollars; the other members of the commission shall receive five dollars each per day for time actually employed, not exceeding fifty days each per annum.

Id., §6.
Compensation of the commissioners.

Section 3488. All expenses incurred under the provisions of this bill shall be audited by the Secretary of State, upon bills being presented, properly certified by the president as approved by the commission, and the said Secretary of State shall from time to time draw warrants upon the State Treasurer for the amount.

Id., §8.
Expenses incurred under this act, how audited and paid.

GAME LAWS OF OREGON.

Section 1930. Every person who shall, within the State of Oregon, between the first day of November in each year and the first day of July of the following year, hunt, pursue, take, kill or destroy any male deer or buck, shall be guilty of a misdemeanor. Every person who shall, between the first day of January and the first day of August, from and after the passage of this act, pursue, hunt, take, kill or destroy any female deer or doe shall be guilty of a misdemeanor. Every person who, after the passage of this act, shall take, kill or destroy any male or female deer at any time, unless the carcass of such animal is used or preserved by the person slaying it, or is sold for food, is guilty of a misdemeanor.

Oct. 20, 1882. §1
Laws of 1882.
p. 11.
Killing deer
out of season.

Section 1931. Every person who buys, sells, or has in possession any of the deer enumerated in the preceding section, within the time the taking or killing thereof is prohibited, except such as are tamed or kept for show or curiosity, is guilty of a misdemeanor.

Id., §2.
Buying, selling
etc., of deer out
of season.

Section 1932. Every person who shall, within the State of Oregon, between the first day of January and the first day of August of each year, hunt, pursue, take, kill or destroy any elk, moose, or mountain sheep, shall be guilty of a misdemeanor.

Id., §3.
Unlawful kill-
ing of moose,
elk, etc.

Every person who takes, kills, injures or destroys, or pursues with intent to take, kill, injure or destroy, any elk, moose, or mountain sheep, at any time, for the sole purpose of obtaining the skin, hide or horns of any such animal, shall be guilty of a misdemeanor.

Section 1933. Every person who shall, within the State of Oregon, between the first day of May and the first day of September of each year, take, kill, injure or destroy, or have in possession, sell, or offer for sale, any

Id., §4.
Unlawful kill-
ing of ducks,
swan, and the
like.

Oct. 20, 1882. § 4
Same subject.

wild swan, mallard duck, wood duck, widgeon, teal, spoonbill, gray, black, sprigtail, or canvasback duck, shall be guilty of a misdemeanor; *provided*, that any person may kill ducks at any time to protect his growing crops.

Id., § 5.
Unlawful killing of prairie chicken and sage hen.

Section 1934. Every person who shall, within the State of Oregon, between the first day of April and the fifteenth day of June of each year, for any purpose take, kill, injure, or destroy, or have in possession, sell, or offer for sale any prairie chicken or sage hen, shall be guilty of a misdemeanor.

Oct. 20, 1882. § 6.
Unlawful killing of grouse, pheasants, and the like.

Section 1935. Every person who shall, within the State of Oregon, between the first day of January and the fifteenth day of July of each year take, kill, injure, or destroy, or have in possession, sell, or offer for sale any grouse, pheasant, quail, or partridge, shall be guilty of a misdemeanor.

Id., § 8.
Catching certain fowl with traps, etc.

Section 1937. Every person who shall, within the State of Oregon, at any time after the passage of this act, trap, net, or ensnare, or attempt to trap, net, or ensnare any quail, or bob-white, prairie chicken, grouse, or pheasant, or have in possession any live quail or bob-white, prairie chicken, grouse, or pheasant, shall be guilty of a misdemeanor.

Id., § 9.
Destroying the nests of certain fowls.

Section 1938. Every person who shall, within the State of Oregon, at any time after the passage of this act, destroy or remove from the nest of any mallard duck, widgeon, wood duck, teal, spoonbill, gray, black, sprigtail, or canvasback duck, prairie chicken, or sage-hen, grouse, pheasant, quail, or partridge, or other wild fowl, any egg or eggs of such fowls or birds, or have in possession, sell, or offer for sale any such egg or eggs, or wilfully destroy the nest of any such fowls or birds, shall be guilty of a misdemeanor.

Id., § 10.
Having game birds and animals in possession out of season.

Section 1939. Every person who shall have any male deer or buck, or any female deer or doe, or spotted fawn, elk, moose, or mountain sheep, swan, mallard duck, wood duck, widgeon, teal, spoonbill, gray, black, sprigtail, or canvasback duck, prairie chicken, or sage hen, grouse, pheasant, quail, bob-white, or partridge, mountain or brook trout, at any time when it is unlawful to take or kill the same, as provided in this act, shall be guilty of a misdemeanor; and proof of the possession of any of the aforesaid animals, fowls, birds, or fish at a time when it

is unlawful to take or kill the same in the county where the same is found shall be *prima facie* evidence in any prosecution for a violation of any of the provisions of this act that the person or persons in whose possession the same is found, took, killed or destroyed the same in the county wherein the same is found during the period when it is unlawful to take, kill or destroy the same.

OCT. 20, 1882. §10
Same subject.

Section 1940. Every person convicted of a violation of any of the provisions of this act shall be punished by a fine of not less than ten dollars, and not more than three hundred dollars, or imprisonment in the county jail of the county where the offense was committed, for not less than five days, nor more than three months, or both such imprisonment or fine. One-half of all money collected for fines for violation of the provisions of this act shall be paid to informers, and one-half to the district attorney in the county in which the case is prosecuted.

Id., § 11.
Penalty for violating this act; disposition of fines.

Section 1941. It shall be unlawful for any person in the State of Oregon, for and during the term of six years from and after the passage of this act, to injure, take, kill, expose, or offer for sale, or have in possession, except for breeding purposes, any ring-neck Mongolian pheasant, any green Japanese pheasant, any copper pheasant, or scholmeringu, any tragopan pheasant, silver pheasant, or golden pheasant, being the species of pheasants imported into this State by the Honorable O. N. Denny, ex-United States consul general to Shanghai, China.

Nov. 21, 1885. §1
Laws of special session of 1885, p. 5.
Taking or killing Mongolian pheasant.

Section 1942. Any person violating the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by fine not less than fifty dollars, nor more than one hundred dollars, and in default of payment of the fine imposed shall be imprisoned in the county jail at the rate of one day for each two dollars of the fine imposed.

Id., § 2.
Penalty therefor.

Section 1943. The one-half of all fines imposed and collected under the provisions of this act shall be paid to the informer, and the rest into the county treasury of the county in which the crime was committed.

Id., § 3.
Disposition of fines.

Section 1944. Justice courts shall have jurisdiction of the offenses defined in this act.

Id., § 4.
Jurisdiction in justice's court.

LIST OF FISH COMMISSIONERS
OF THE
UNITED STATES AND CANADA.

UNITED STATES.

Colonel Marshall McDonald, commissioner, Washington, D. C.
Captain J. W. Collins, assistant in charge of fisheries division.
Richard Rathbone, assistant in charge of scientific inquiry.
George H. H. Moore, superintendent of distribution.

ALABAMA.

Colonel D. R. Hundley, Madison.
Hon. Charles S. G. Doster, Prattsville.

ARIZONA.

J. J. Gosper, Prescott.
Richard Rule, Tombstone.
J. H. Taggart, business manager, Yuma.

ARKANSAS.

H. H. Rottaken, president, Little Rock.
W. H. Worthen, secretary, Little Rock.
J. W. Calloway, Little Rock.

CALIFORNIA.

Joseph Routier, Sacramento.
J. D. Harvey, Los Angeles.
Commissioner J. T. Sherwood, resigned March 15, 1888.

COLORADO.

G. F. Whitehead, Denver.

CONNECTICUT.

Dr. William M. Hudson, Hartford.
Robert G. Pike, Middletown.
James A. Bill, Lyme.

DELAWARE.

Charles Schubert, Odessa.

GEORGIA.

J. H. Henderson, superintendent, Atlanta.

Dr. H. H. Cary, La Grange.

ILLINOIS.

N. K. Fairbank, president, Chicago.

S. P. Bartlett, secretary, Quincy.

George Breuning, Centralia.

INDIANA.

W. T. Dennis, Richmond.

IOWA.

E. D. Carlton, superintendent, Spirit Lake.

Ole Bjorenson.

KANSAS.

S. Fee, Wamego.

KENTUCKY.

William Griffith, president, Louisville.

P. H. Darby, Princeton.

John B. Walker, Madisonville.

Hon. C. J. Walton, Mumfordsville.

Hon. John A. Steele, Midway.

W. C. Price, Danville.

Hon. J. M. Chambers, Independence.

A. H. Goble, Catlettsburg.

J. H. Mallory, Bowling Green.

MAINE.

E. M. Stilwell, Bangor.

Henry O. Stanley, Dixfield.

B. W. Counce, sea and shore fisheries, Thomaston.

MARYLAND.

Dr. E. W. Humphries, Salisbury.

G. W. Delawder, Oakland.

MASSACHUSETTS.

E. A. Brackett, Winchester.

E. W. Putnam, Cambridge.

E. H. Lathrop, Springfield.

MICHIGAN.

John H. Bissell, Detroit.
Herschel Whitaker, Detroit.
Joel C. Parker, M. D., Grand Rapids.
Walter D. Marks, superintendent, Paris.
George D. Mussey, secretary, Detroit.
William A. Butler, Jr., treasurer, Detroit.

MINNESOTA.

William Bird, Fairmount.
Miles Carpenter, Rushford.
Robert Ormsby Sweeney, president, St. Paul.
S. S. Watkins, superintendent, Willow Brood, St. Paul.

MISSOURI.

H. M. Garlichs, chairman, St. Joseph.
J. L. Smith, Jefferson City.
H. C. West, St. Louis.
A. P. Campbell, secretary, St. Joseph.
Superintendents:—
Philip Kopplin, Jr., St. Louis.
Elias Cottrill, St. Joseph.

NEBRASKA.

William M. May, Fremont.
R. R. Livingston, Plattsmouth.
B. E. B. Kennedy, Omaha.
M. E. O'Brien, superintendent, South Bend.

NEVADA.

W. M. Cary, Carson City.

NEW HAMPSHIRE.

Geo. W. Riddle, Manchester.
Elliot B. Hodge, Plymouth.
John H. Kimball, superintendent of Plymouth and Sunapee hatcheries, Marlborough.
Commissioner E. B. Hodges, Plymouth.

NEW JERSEY.

William Wright, Newark.
Frank M. Ward, Newton.
J. R. Elkinton, Pennsgrove.

NEW YORK.

E. G. Blackford, president, New York.
Gen. R. U. Sherman, New Hartford.
William H. Bowman, Rochester.
A. S. Jollne, Tottenville.
Henry Burden, secretary and acting engineer, Troy.
E. P. Doyle, room 56, Fulton bank building, New York City.
Superintendents:—
Fred Mather, Cold Spring Harbor.
Monroe A. Green, Caledonia, Mumford, N. Y.
James H. Marks, Bloomingdale, N. Y.
E. L. Marks, Fulton Chain, Old Forge, N. Y.
E. F. Boehm, Lacondaga, Newton Corners, N. Y.

NEW YORK SHELL FISH COMMISSION.

E. G. Blackford, commissioner, 80 Fulton Market, New York.
J. W. Mersean, oyster protector, 80 Fulton Market, New York.

NORTH CAROLINA.

William J. Griffin, chairman, Elizabeth City.
J. B. Watson, Englehard.
William T. Cahoon, Bayboro.

OHIO.

C. V. Osborn, president, Dayton.
A. C. Williams, secretary, Chagrin Falls.
J. C. Hoffer, Bellaire.
John H. Law, Cincinnati.
Hon. Emery D. Potter, Toledo.
Henry Douglass, superintendent, Sandusky.
L. K. Buntain, chief warden, Dayton.

OREGON.

F. C. Reed, president, Astoria.
E. P. Thompson, Salem.
R. C. Campbell, Rainier.

PENNSYLVANIA.

Henry C. Ford, president, 524 Walnut street, Philadelphia.
James V. Long, corresponding secretary, 75 Fifth avenue, Pittsburgh.
H. C. Demuth, secretary of board, Lancaster.
S. B. Stilwell, Scranton.
A. S. Dickson, Meadville.
W. L. Powell, treasurer, Harrisburg.

Superintendents:—

John P. Cleveling, Allentown; William Buller, Corey.

RHODE ISLAND.

John H. Barden, president, Rockland.

Henry T. Root, treasurer, Providence.

William P. Morton, secretary, Johnston.

SOUTH CAROLINA.

Hon. A. P. Butler, Columbia.

TENNESSEE.

W. W. McDowell, Memphis.

H. H. Sneed, Chattanooga.

Edward D. Hicks, Nashville.

UTAH.

A. Milton Musser, Salt Lake City.

VERMONT.

Herbert Brainard, St. Albans.

F. H. Atherton, Waterbury.

VIRGINIA.

Dr. J. T. Wilkins, Bridgetown.

WEST VIRGINIA.

C. S. White, president, Romney.

F. J. Baxter, treasurer, Sutton.

James H. Miller, secretary, Hinton.

WISCONSIN.

The Governor, *ex officio*.

Philo Dunning, president, Madison.

C. L. Valentine, secretary and treasurer, Janesville.

Mark Douglass, Melrose.

A. V. H. Carpenter, Milwaukee.

Calvert Spensley, Mineral Point.

E. S. Miner, Sturgeon Bay.

James Nevin, superintendent, Madison.

WYOMING.

Louis Miller, Laramie.

WASHINGTON.

James Crawford, Vancouver.

DOMINION OF CANADA.

Hon. John Tilton, deputy minister of fisheries, Ottawa.

Inspectors of fisheries for 1888:—

W. H. Rogers, Amherst, Nova Scotia.

A. C. Bertram, North Sidney, Cape Breton, Nova Scotia.

W. H. Venning, St. John, New Brunswick.

William Wakeman, Gaspé Basin, Province of Quebec.

J. H. Duvar, Prince Edward Island.

Thomas Mowat, New Westminster, British Columbia.

Alexander McQueen, Winnipeg, Manitoba.

OFFICERS IN CHARGE OF FISH BREEDING ESTABLISHMENTS.

S. Wilmot, superintendent of fish culture, Newcastle, Ontario.

Charles Wilmot, officer in charge Newcastle hatchery, Ontario.

William Parker, Sandwich, Ontario.

L. N. Cattellier, Tadoussac, Province of Quebec.

Philip Vibert, Gaspé, Province of Quebec.

Alexander Mowat, Ristigouche, Matapedia, Province of Quebec.

A. B. Wilmot, Bedford, Nova Scotia.

C. A. Farquharson, Sidney, Nova Scotia.

Isaac Sheasgreen, Miramichi, New Brunswick.

Charles McCluskey, St. John river, Grand Falls, New Brunswick.

Henry Clark, Dunk river, Prince Edward Island.

Thomas Mowat, British Columbia hatchery, New Westminster, British Columbia.

In conclusion, the commission desire to congratulate the people of the State upon the future prospects for an increased supply of fish, and we ask that all who can in any manner help to foster this good work may do so cheerfully, knowing that whatever cheapens the food of the people, when wages tend to the minimum, and are so near the cost of living, is to be desired; and a small amount of money expended each year by the State for the artificial propagation of fish will do much toward accomplishing this end, and will, like bread cast upon the waters, return after many days.

Respectfully submitted,

F. C. REED,
E. P. THOMPSON,
R. C. CAMPBELL,
Commissioners.