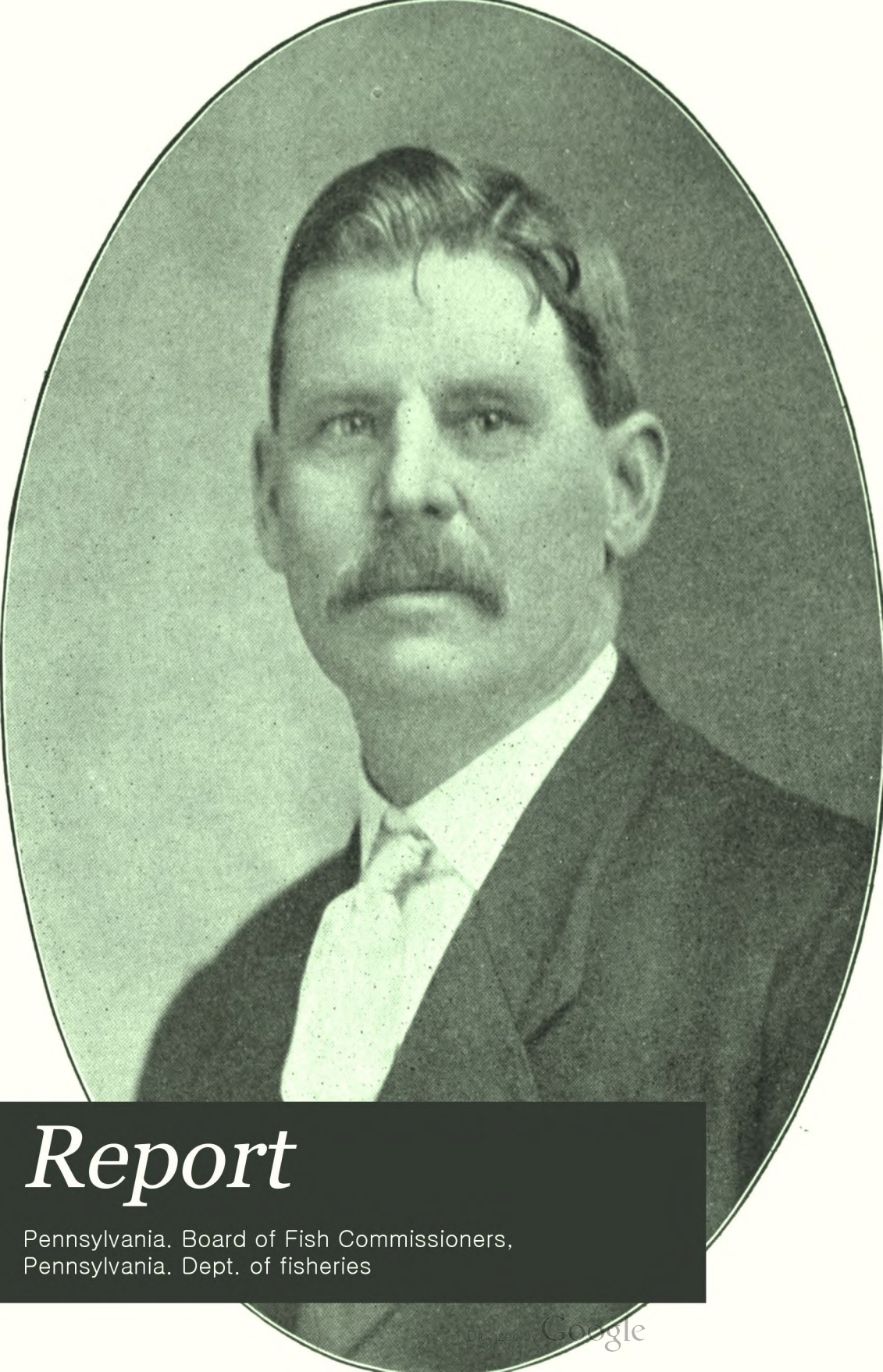
This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google books

http://books.google.com

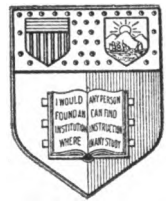


Report

Pennsylvania. Board of Fish Commissioners,
Pennsylvania. Dept. of fisheries

Digitized by Google

1908/09



New York
State College of Agriculture
At Cornell University
Ithaca, N. Y.

Library

Digitized by Google

Date Due

Library Bureau Cat. No. 1137

CORNELL UNIVERSITY LIBRARY

3 1924 070 919 919

Digitized by Google

Digitized by Google

Digitized by Google

Jeremiah R. Driscoll, Captain of the Commodore Perry.

Digitized by Google

Commonwealth of Pennsylvania.

REPORT

OF THE

Department of Fisheries

FROM

DECEMBER 1, 1908, TO NOVEMBER 30, 1909

HARRISBURG:
C. E. AUGHINBAUGH, PRINTER TO THE STATE OF PENNSYLVANIA
1910

Digitized by Google

@
SH11
P4A2
1908/09

@ 53219

Digitized by Google

DEPARTMENT OF FISHERIES OF THE COMMONWEALTH OF PENNSYLVANIA.

Commissioner of Fisheries.

W. E. MEEHAN, Office, Harrisburg.

Board of Fishery Commissioners.

WILLIAM E. MEEHAN, President.
JOHN HAMBERGER, Erie.
HENRY C. COX, Wellsboro.
ANDREW R. WHITAKER, Phoenixville.
W. A. LEISENRING, Mauch Chunk.

Superintendents of Hatcheries.

Corry Hatchery No. 1, William Buller, Corry, Pa.

Erie Hatchery No. 2, Philip H. Hartman, Erie.

Bellefonte Hatchery No. 3, Howard M. Buller, Bellefonte, R. F. D. No. 2. Assistant Superintendent, Harry I. Griffith, Bellefonte, R. F. D. No. 2.

Wayne County Hatchery No. 4, Nathan R. Buller, Pleasant Mount.

Torresdale Hatchery No. 5, Jerry R. Berkhous, Holmesburg, Philadelphia.

Erie Auxiliary No. 6 (Union City Hatchery), Abraham G. Buller, Union City.

Spruce Creek Hatchery No. 7, William F. Haas, Spruce Creek, Pa.

Crawford Hatchery No. 8, W. H. Safford, Conneaut Lake.

Steam tug "Commodore Perry"—Captain Jerry R. Driscoll, Erie.

Digitized by Google

Digitized by Google

LETTER OF TRANSMITTAL.

Hon. Edwin S. Stuart, Governor of Pennsylvania, Harrisburg, Pa.

Sir: I have the honor to herewith present the report of the Department of Fisheries for the year beginning December 1, 1908, and ending November 30, 1909, the sixth report since my incumbency as Commissioner of Fisheries.

Respectfully,

W. E. MEEHAN,
Commissioner of Fisheries.

Digitized by Google

Digitized by Google

REPORT

OF THE

BOARD OF FISHERY COMMISSION.

Honorable Edwin S. Stuart, Governor of the Commonwealth of Pennsylvania, Harrisburg, Pa.

Sir: We have the honor to herewith present a report of the operations of the Department of Fisheries from December 1, 1908, to November 30, 1909. In the work of hatching and distributing fish the Department has broken all previous records as well as the previous records of all other states, and nearly half of the magnificent record made by the United States Bureau of Fisheries in 1908. The total output from the various hatcheries foots up to the great total of 1,157,615,764, divided as follows:

Corry, 4,239,300; Erie, 244,136,245; Bellefonte, 3,577,082; Wayne, 481,880,900; Torresdale, 156,851,182; Union City, 161,750,030; Crawford, 93,135,900; Spruce Creek, 540,625. The same stations in 1908 had the following outputs:

Corry, 3,680,775; Erie, 247,752,300; Bellefonte, 2,547,404; Wayne, 219,759,000; Torresdale, 109,191,900; Union City, 26,690,813; Crawford, 51,554,500; Spruce Creek, 772,500.

It will be seen by the above that there was an increased output at each station excepting Erie and Spruce Creek. The decreased output at Erie was due, not to a shortage of eggs or less work, but to the fact that it was deemed advisable for economy of shipment to applicants to send large quantities of eggs, like the pike-perch and blue pike, to other stations to be hatched. For example, 106,505,000 pike-perch eggs alone were sent to Crawford, Union City, Torresdale and Wayne stations. These eggs were all eyed, which means that the preliminary work had all been done in the Erie hatchery.

The decrease at the Spruce Creek hatchery was due to the fact that in 1908 most of the trout eggs had been received from other sources, while in 1909 scarcely any eggs were handled excepting from the brood fish in the ponds. Owing to the fact that the Erie hatchery was being used to carry pike-perch eggs to the eye stage, it was impossible to send thither any quantity of yellow perch or pickerel eggs from the field in northeastern Pennsylvania. For these reasons the Erie station, while its figures show a decrease, should be really credited with an increase as was the case in all other hatcheries, excepting Spruce Creek. What makes the increase especially gratifying is the

Digitized by Google

fact that it is almost without exception in every species of fish propagated, showing that the output is the result of natural expansion and not from an abnormal number of eggs from any one species of fish as was the case in 1898 when there was a phenomenal run of pike-perch in Lake Erie.

From the reports of Commissioner Meehan and the Superintendents, it appears that the percentage of hatch at the different stations was gratifyingly large; the only poor percentage was in a number of cases of eggs of white fish and pike-perch received from Port Clinton, Ohio, and about a million trout eggs from outside sources.

Increased pond capacity, a greater number of jars in the battery stations and extended field work contributed principally to the great increase in the output. Concerning the importance of field work, the Board of Fishery Commission cannot speak too highly. It constitutes to-day the bulk of the outputs from all the hatcheries, save Spruce Creek, Bellefonte and Corry. It is only limited by the amount of money available to employ suitable men and capacity to take care of the eggs in the hatching houses. Field work consists in gathering eggs from fish which have been caught in nets for market purposes or which have been naturally deposited. In the first instance all eggs not so taken and incubated in the hatcheries are lost or destroyed, and, in the second instance, at least 95 per cent. would be devoured by spawn eating fishes. Hence, field work may be briefly described as saving the waste, and every fish hatched, planted and grown to maturity is clear gain. The economy of this feature of fish culture is shown by the fact that less than $3,000 a year is available for the collection of eggs, while the cost of hatching is scarcely half the annual appropriation for propagation purposes.

The Board believes that the fish culturists of the Department have mastered the difficult problem of the propagation of small mouth bass, at least to the extent of successfully hatching the eggs and caring for the advanced fry to the age of 15 days, with scarcely any loss, and a large proportion to the age of 30 days, and by the system adopted at the various hatcheries, to produce the fish at a reasonable cost. It is true that no method has yet been discovered of taking the eggs from the small mouth bass by artificial expression, but by building large ponds, the outputs can be materially increased. A pond covering more than an acre for small mouth bass was built at the Crawford hatchery, and one of more than two acres started at the Spruce Creek station. Even these, the Board believes, are smaller than ponds in the future will be.

While the Department has depended chiefly on the field for the collection of yellow perch eggs, the fish is so easily retained in hatcheries that it has been deemed advisable to construct large ponds on some of the hatcheries to augment that source of supply. A pond a tenth of a mile long for yellow perch is nearly completed at the Wayne hatchery and large ponds are in use at Crawford, Union City and Torresdale, and these ponds last spring yielded about 100,000,000 yellow perch eggs and their capacity when fully stocked with brood fish will be over 500,000,000.

It has also been thought that the ordinary ponds on the trout hatcheries are not large enough to properly care for female trout of three years old and over. The older the fish become the greater the area of water required proportionately to keep them in good health.

Digitized by Google

Believing this, a pond nearly 300 feet long and 85 feet wide has been built at Corry, and another nearly the same size constructed at Spruce Creek. The pond at Corry should, when stocked with large fish, nearly double the capacity at that station for brook trout. In other words, permit an annual output from Corry alone equal to the present outputs of all the hatcheries in the State at which these fish are propagated, and the same may be said of the pond at Spruce Creek. It is intended to construct a similar pond at Bellefonte next summer.

The vast quantities of fry of white fish, lake herring and blue pike deposited annually in Lake Erie continues to prove the efficacy of fish culture. In the report of the Board last year it was stated that "the value of artificial fish culture, especially that part of it which is designated as field work, has been demonstrated to an astonishing degree in Erie. Five or six years ago it scarcely paid the fishermen of the port of Erie to fish, especially for white fish. At present there are at least six large steam tugs fitted out with white fish nets and everybody fishing is sure to bring in a greater or less quantity of this very valuable food fish daily. As many as two tons of white fish have been caught in a single boat, for which the fishermen receive eight cents per pound."

The condition which provoked this utterance last year holds equally good this. Indeed, the catch of white fish in 1909 is greater than that of the previous year.

Another evidence of the value of propagation is shown by the great numbers of white fish of all sizes that were taken daily. During the last week in September and the greater part of October nearly one-third of the catch from the lake herring gill nets proved to be two year old white fish. One boat brought in on one occasion one thousand pounds of these immature fish out of a total of three thousand pounds. They were in such vast quantities in the lake herring grounds that the fishermen who did not want to catch these small white fish moved their nets to other places and even then an undue proportion were caught.

On account of the presence of so many small white fish, some of the fishermen of Lake Erie in placing their orders for gill nets for next year have increased the meshes beyond the minimum size required by law. If the funds of the Department would permit there is not the slightest doubt in the world that within another five years the white fish industry, five years ago worth practically nothing, now occuping fourth place, would rank at least equal with that of the blue pike, which is the leading industry to-day at the port of Erie.

We reported last year a phenomenal run of lake herring and believed it to be due principally to the work of Pennsylvania hatcheries. This belief is confirmed since the run this year was quite as large as in 1908. So firmly convinced are the fishermen in Erie of this fact that one of the large dealers has built a commodious plant and established a new industry, namely, smoked lake herring or ciscoes. The capacity is 40 tons a day.

Another concern also has a smaller plant. These two rendered it possible this year to handle all the lake herring caught in the nets. That the increase in lake herring is largely due to Pennsylvania's work is shown by the fact that Pennsylvania is the one State which propagates the particular species that inhabit the lower part of the

Digitized by Google

lake, Ohio and the United States work being confined to the species commonly known as the Jumbo, quantities of which, by the way, are beginning to show up in Pennsylvania waters. The Canadian fishermen are feeling the effects of the work in increased catches of lake herring, white fish and blue pike. Blue pike were caught for the first time this fall by Canadian fishermen in large quantities.

The interior lakes continue to show an increase in the fishes propagated by the State, and the catch of shad in the Delaware river last spring was for the first time in 10 years more nearly equal to the years between 1890 and 1900.

The drought which was so severely felt in Pennsylvania in 1908 continued in many parts of the State with even greater severity this year. In some sections the situation is alarming and water famine prevails. On rivers like the Susquehanna and Delaware the upper reaches are little more than creeks. Numerous streams are either entirely dry or nearly so. Under such conditions as may be expected, the angling interests have severely suffered. From reports numerous trout streams have been completely depopulated, and bass fishing as well as other river fishing, for the last half year at least, was of little account.

The Wayne hatchery has been for the time being rendered practically useless for trout breeding or even for the propagation of the warm water fishes. The large spring which supplied the trout ponds is practically dry, there being less than 10 gallons of water per minute flowing from it.

The Lackawaxen river, which has its source about three miles above the hatchery and flows through the grounds and a normal water supply which will fill a 16 inch pipe, scarcely fills a three inch pipe. All the mature trout were killed and all of the ponds excepting the bass pond have had to be temporarily abandoned and the fish of different species all placed in this one body of water. The new perch pond, which was used last spring for the first time, had to have the water drawn off during the summer while the work of completion was in progress and the water supply was so small that on the first of December it was impossible to flow any water into it as what there was was needed for the bass ponds and the trout ponds. It will be spring before this pond can be filled. There is a marked diminution in the water supply at all the hatcheries, but in none excepting Wayne has the danger point been reached.

The Legislature at its last session enacted a new fish protective law which, in many respects is much superior to the Act of 1901. There are, however, in it many inexcusable typographical errors and two or three provisions which the Board believes are not meritorious. One of the most satisfactory sections in the new act is one which forbids pollution from industrial establishments entering the streams of the Commonwealth. The measure went into effect on the first of May and very fair progress has been made by the Department in securing the observance of this provision.

Manifestly the purification of the waters of Pennsylvania cannot be accomplished in a short time or even within the time which the general public, unacquainted with the problems involved, expect. Many forms of pollution injurious to fish life and fish food cannot be stopped with safety to public health, according to the health authorities, until the cities or towns below have established sewage disposal

Digitized by Google

plants in accordance with the decrees of the Department of Health. In other cases, it requires time for industrial establishments to adjust themselves to the new order of things and to install proper purification plants. There are, however, many industrial establishments that can without financial loss to themselves make other disposal of their waste than by emptying it into the streams. In most cases the waste contains byproducts, the value of which exceed the cost of production.

It has been the policy of Commissioner Meehan not to unduly press the owners of industrial establishments, while he has insisted that the law must be observed at the earliest possible moment. It has been his policy, which we approve, to point out to the owners of such places that it is to their financial advantage to obey the law. The wisdom of the course is illustrated by the fact that only five prosecutions had to be instituted since the operation of the new law, while two or three hundred concerns have put in suitable purification plants and many more are installing them. Public sentiment strongly demands the purification of our water supply in order that fish may thrive and thus provide a bountiful supply of a valuable food product; that it may be used for domestic purposes, and that it may be healthful. In each of the five cases in which prosecutions were made, the owners or operators had positively refused to obey the law or inferentially did so by forcibly expelling the wardens from the property while they were there in the performance of their duty. In only one case has an appeal been asked for.

A less number of arrests were made for violation of the fish laws than in 1908. This was due to several causes. First, because of the new law which abolished half the fines to the special wardens and to informers. Second, to a reduction in the force of regular salaried wardens due to an insufficient appropriation to pay the full number formerly employed, and, third, to an interval between May 1st and July, when the wardens were directed to warn rather than to arrest, so that the fishing public might become accustomed to and familiar with the new law.

The total number of arrests were 387, of which 336 were convicted and 17 went to jail in lieu of payment of fines. Thirty-seven of those convicted appealed or took certiorari to the County Courts, where the cases are still pending. Of the 387 arrests made during the year, 281 were made by the regular wardens. The majority of the others were made by special wardens prior to the repeal of the old law. The total amount of fines imposed by magistrates was $6,702.00, of which $4,561.00 were paid to the magistrates. The balance, $2,141.00, are embraced in the cases appealed and in which the defendants elected to go to jail instead of paying. The number of arrests in 1908 were 584, with 485 convictions and 96 acquittals. Of the convicted 54 went to jail and 56 asked for appeals. The regular wardens this year made 281 arrests, while last year the number was 211.

Many of the County Treasurers and Justices of the Peace have in the past been slow in making their returns to the Department, and it became necessary in some cases to take measures only a little short of prosecution to bring them to a realizing sense of their duty and obligation. Some of the fines due the State have been withheld for nearly four years. The Commissioner reports that most of these accounts have been collected.

Digitized by Google

The Board has referred to a decreased number of salaried wardens. Under the Act of May 29, 1901, and the appropriation given, it was possible by the exercise of the most rigid economy to employ 12 men at $50 a month and reasonable expenses. The Act of May 1, 1909, authorized the appointment of 30 wardens and definitely set their salary at $75 a month and reasonable expenses. The Chief Warden, who had been paid $75 a month, was increased by this law to $100 a month. The appropriation, however, was in the aggregate only $5,000 more than the previous two years.

On account of the increase in salaries and the amount of the appropriation, it was found impossible to employ more than nine. Three of the old wardens were retained for a time after the operation of the new law, but were dropped one by one for cause. Three others have been appointed in their places, they agreeing to serve without compensation until such time as there may be money to put them on salary. Of course these three men cannot be expected to perform much work. The consequence is that the nine men now in the employ of the State are overworked, and it is impossible for them to thoroughly cover their district. Their entire time is taken up in investigating and prosecuting specific cases to which their attention has been drawn and they have little or no time for patroling.

The Board desires to draw particular attention to the indifference which a large proportion of the persons who take out licenses for fish baskets exhibit towards observing the provisions of the new law. Comparatively few of the licensees followed them in every particular. Had the wardens prosecuted in every instance in which they found a single violation, the number of arrests and convictions would have been very large. Under the new law the device is not permitted in streams known to contain trout and it is deplorable the number of men, who to evade the law, told the County Treasurers that the streams for which they applied for licenses did not contain trout, and that sometimes in face of the fact that trout were caught both above and below where it was proposed to locate the device. Two or three who secured licenses in this manner when notified by the County Treasurer of the cancellation of the licenses on account of their misrepresentation, and in accordance with an opinion of the Attorney General's Department, became defiant and had to be prosecuted before they were brought to their senses.

A large number of improvements and extensions have been made in the hatcheries during the year. A new hatching house for trout was built at Bellefonte and an addition to the trout house and for battery purposes was erected at Wayne. Besides the yellow perch pond, a large trout pond already mentioned, a number of ponds for yearling and two year old trout were constructed at Spruce Creek and Bellefonte hatcheries. Several ponds for warm water fish were built at Torresdale and Union City. The property at Erie was enlarged by the purchase of additional grounds and a dwelling house for the accommodation of the Superintendent. A house for the accommodation of an assistant was built at Crawford in order that the man might be had on the place at all hours, day and night, in case he is needed. Ice houses were also erected at Spruce Creek and Wayne to save the purchase of that commodity during shipping time.

The Torresdale hatchery, although established since the creation of the Department, has nearly all available space occupied by ponds, so that with beautifying, the plant may be said to be completed, al-

Digitized by Google

though a new hatching house will have to be built in the near future as the building now in use was constructed nearly 20 years ago for use at Bristol as a field station. It is not only anything but an ornamental structure, but is rapidly becoming too small for the work required.

Soon after the breaking up of the ice in Lake Erie, the Commodore Perry, the Department's boat, was again put in commission and has been employed regularly since and will probably not be put into winter quarters and the crew laid off until the first of January.

The craft has proven invaluable to the Department. As a patrol boat it has practically put a stop to all poaching in Pennsylvania waters on the part of unlicensed fishermen from other States, it has nearly made fish law violations in those waters a thing of the past, and rendered great service in preventing raids on the nets of the licensed fishermen. There was only one instance where a seizure of nets become necessary in the early part of the year. The nets belonged to a local fish company, but it appeared that the owners were themselves not aware of the fact that the nets were illegal. They had ordered the twine from the factory and put them in the water without first examining to see whether or not the meshes conformed to the law. The firm was therefore not prosecuted and only the nets actually seized by the boat were confiscated and the company permitted to retain the remainder on their promise to take them to another state where they conformed to the law.

In field work the Commodore Perry has been invaluable, conveying eggs from the different fishing grounds to the hatchery and bringing fish for propagation purposes from the pound nets.

Apart from the usefulness of the Commodore Perry in fish protection and fish cultural work, it has made, through its staunchness and the heroism of the officers and crew, a brilliant record in the cause of humanity. On April it made two trips in the midst of a raging sea to the rescue of disable tugs and brought them safely to port, together with the crews of 10 men in all. Before the storm had disappeared and while the captains of most of the craft considered it too dangerous to set forth, Captain Driscoll and the crew steamed out into the lake in search of a third tug that had not turned up. It failed to save the craft sought for, but did find and restore to the sorrowing friends two bodies. Later Captain Driscoll and the crew, by means of the Commodore Perry, saved the crew of a boat that had been driven ashore during a summer storm, and while this report was being prepared, a telegraph dispatch was received by the Department announcing the recovery of a boat containing the frozen bodies of nine men belonging to an illfated steamer sunk in Lake Erie during a tremendous storm. The Board expressed its appreciation of the heroism of last spring to Captain Driscoll and his crew by resolutions, which resolutions were presented by Your Excellency in person to Captain Driscoll, with suitable words of appreciation on your own account.

A section in the law of May 1, 1909, defines a trout stream and provides that in cases of a conflict of statement the Board of Fishery Commission shall investigate and its decision be final. Within a few weeks after the enactment of this law, a number of disputes were referred to the Board. Several have been investigated and decisions rendered. There still remain about an equal number to be considered and passed upon. Doubtless there will be more as time passes.

Digitized by Google

The work of the Department has increased with such rapid strides that the hatchery force must be increased in the near future, and the office force is barely able to dispose of the daily volume of work. Several new features which would increase the efficiency of the Department are either far behind or have to remain undone. A chief clerk, an additional stenographer are urgently needed, and there should be a man to conduct scientific investigation with relation both to proper foods for the waters to maintain fish life properly and the bacteriological condition of the water.

The necessity for the increase in both the hatchery and the office force becomes the more apparent with the possibility of the acquisition of a large tract of land on Presque Isle Peninsula for hatchery purposes. Should this tract be turned over to the Department of Fisheries, there will be a hatchery of about one thousand acres containing a number of natural ponds or lakes varying in length from half a mile to three-fourths or more long.

The property is at present a wilderness of trees and underbrush with many swampy places and with all the ponds surrounded by morasses. When completed it will make the largest hatchery in the world. The movement for the acquisition of this property was begun by some citizens of Erie, taken up by the Board of Trade, the Chamber of Commerce of Erie, and the fishing interests. Many meetings in behalf of the movement were held in Erie with the result that a bill was introduced into and passed by the Legislature of Pennsylvania at the last session to turn over the property to the Department of Fisheries, subject to the approval of the National Government.

Presque Isle Peninsula was formerly State property, but was turned over to the United States for specific purposes. Only a small portion has been so used. Subsequently another portion, with the approval of Congress, was turned over by the Legislature of Pennsylvania to the city of Erie, to be used for water reservoir purposes. A bill is to be introduced at the session of Congress in December to ratify the action of the Pennsylvania Legislature. Both United States Senators and the Congressmen of Pennsylvania are pledged to the support of the bill, and the Chairman of the Committee, to which the bill will be referred, has visited the site and spoken enthusiastically in favor of the project.

Should the property come under the jurisdiction of the Department of Fisheries, another Superintendent and a force of assistants will be required, and much additional work will result in the office of the Department itself.

The above is respectfully submitted.

W. E. MEEHAN,
Commissioner of Fisheries.

ANDREW R. WHITAKER,
W. A. LEISENRING,
JOHN HAMBURGER,
HENRY C. COX,
Board of Fishery Commission.

Digitized by Google

REPORT OF THE COMMISSIONER OF FISHERIES.

Again I take pleasure in reporting that the Department of Fisheries has broken all records in the propagation of fish. From December 1, 1908, to November 30, 1909, there was a total output of 1,157,615,764, as against 661,952,851 the previous year, and 663,387,524 in 1907, which, until now was the banner year in the history of the Department of Fisheries. In every line of work there has been satisfactory progress, although the Department has been greatly hampered in the enforcement of the fish laws by the fact that the appropriation is only sufficient to pay eight wardens at the increased salary named by the Legislature.

OUTPUTS.

The following table exhibits the outputs of fish, frogs, etc., from the various hatcheries and through field work from December 1, 1908, to November 30, 1909, inclusive. The table does not include eggs shipped from one hatchery to another.

Brook Trout, advanced fry, fingerlings and adults, ...	9,246,375
Rainbow Trout, advanced fry, fingerlings and adults, ..	42,950
Gold Fish, ...	4,082
Catfish and Bullheads,.....	459,816
Brown Trout, fingerlings, ...	34,300
Shad, fry, ...	15,000,000
Sturgeon, fry, ...	408
Lake Trout, ...	2,395,000
Pickerel, ...	300,150,000
Silver Side Salmon, ...	75,000
Yellow Perch, ...	397,045,140
Sunfish, ...	699,280
Calico Bass, ...	15,131
Frogs, ...	463,000
Blue Pike, ...	99,666,000
Lake Herring, ...	114,934,400
White Fish, ...	47,869,700
Wall-eyed Pike, ...	168,875,000
Black Bass, small mouth, ...	506,906
Black Bass, large mouth,.....	83,200
Rock Bass, ...	76
Cutthroat Trout, ...	50,000
Total, ...	1,157,615,764

Digitized by Google

APPLICATIONS FOR FISH.

The following is the number of applications for different species of fish filed with the Department of Fisheries and sent to the different hatcheries to be filled:

Brook Trout,	3,620
Rainbow Trout,	12
Brown Trout,	3
Small Mouth Black Bass,	670
Yellow Perch,	460
Pickerel,	483
Wall-eyed Pike,	206
Sunfish,	238
Catfish,	330
Frogs,	176
Lake Trout,	11
Total,	6,209

PERMITS ISSUED.

The following permits were issued during the year for the purposes named:

For transplanting fish to other waters,	18
For using dynamite for engineering purposes,	12
For bonded seines for taking carp, suckers and mullets,	1
For taking fish for scientific purposes,	5
For preventing escape of pickerel into trout streams,	1
For taking fish for aquarium,	1
For taking trout for spawning purposes,	1
For closing fishway on account of low water,	2
Total,	41

Digitized by Google

COMMERCIAL FISH INDUSTRY IN LAKE ERIE.

There was a healthy increase in the fish industry of Lake Erie during 1909, and this applies both to the amount caught and the sum realized by the fishermen. The total catch in 1909 foots up to 10,904,617 pounds as against 6,999,051 pounds in 1908. The catch realized $284,822.11 as against $200,869.53 in 1908. The increase was most notably with lake herring and blue pike. In 1908 the catch of lake herring was 3,816,691 pounds. This year it was 6,167,187 pounds. The blue pike catch in 1908 was 2,606,357 pounds, and this year it was 4,196,543 pounds. There was a slight fall off in the catch of salable white fish. In 1908 it was 394,763 pounds with a value of $31,580.14. This year the catch was 295,701 pounds, and the value $25,036.94.

This slight fall off is accounted for by a severe storm which prevailed during the height of the white fish season. The total catch of fish was greater than any year since the creation of the Department. There was one firm added to the list of those engaged in the business in Erie, but this additional business house does not make up all of the increased business. Each and every firm contributed to the healthy condition of affairs.

An interesting feature of the business is the fact that it was found for the first time that the carp industry had assumed sufficient importance to separate it from the miscellaneous fishes. The catch was 58,832 pounds, the value of which was $744.98. The value seems small, but it must be remembered that the amount represents not what the fish were sold for, but what the fishermen received for them, the wholesale price in New York and Philadelphia and Pittsburgh being much larger, as will be seen in the tables showing the retail fish business of the State. The following table shows the total catch of fish and the value of each during the year 1909:

Name.	Number of Pounds.	Value.
Catfish,	1,844	$135 86
Lake herring,	6,167,187	129,199 70
Yellow pike,	17,581	1,331 94
Blue pike,	4,196,543	124,228 29
White fish,	295,701	25,036 94
Carp,	58,832	744 98
Yellow perch,	14,605	558 10
Sturgeon,	4,495	799 14
Lake trout,	14,779	1,157 25
Miscellaneous,	133,050	1,629 91
Total,	10,904,617	$284,822 11

The following table shows the catch of the three principal fish, blue pike, lake herring and white fish, by pounds from 1903:

Name.	1903.	1905.	1906.	1907.	1908.	1909.
Blue pike,	1,964,000	3,215,863	1,021,206	2,159,983	2,606,357	4,196,543
Lake herring,	5,033,000	3,060,250	2,696,065	1,883,963	3,816,691	6,167,187
White fish,	36,500	31,969	113,278	574,265	394,763	295,701

Digitized by Google

The following table gives the value of the catch for each year since 1903, excepting 1904, when no records were obtainable:

1903,	$300,000.00
1905,	201,085.94
1906,	168,995.14
1907,	305,913.39
1908,	200,869.53
1909,	284,822.11

A perusal of the table giving forth the number of pounds and value will show that the catch of yellow pike also have increased over the year 1908, when for the first time the industry was considered of sufficient importance to give it a separate place in the table. In 1908 the number of pounds was 9,884 with a value of $697.56. This year there were caught 17,581 pounds with a value of $1,331.94. This is an unexpected encouragement as for many years the State has been hatching and planting yellow pike, otherwise known as pike perch, on a vast scale and the catch did not seem commensurate with the stocking.

It is believed, however, that many of the eggs sent to the Erie station as yellow pike eggs are in reality blue pike. The eggs of the blue pike come from Ohio waters and it is not an uncommon thing to find blue pike among those fish. Indeed ichthyologists claim that there is no difference between the yellow pike and blue pike; that the two fish may be varieties, but even that is doubtful. There seems to be no structural difference, the only distinguishing feature being the color of the fish, the size of the eggs and the period of spawning and to some extent the size of the fish themselves.

The yellow pike, as a rule, run much larger than the blue pike. The eggs are larger almost invariably whether the blue pike be large or small fish. It was supposed also that the section of Lake Erie controlled by Pennsylvania is not the best grounds for the yellow pike; that they are more abundant and favor the upper end of the lake, that is to say the southeastern portion governed by the State of Ohio. The marked increase this year, however, not being abnormal is indicative of stocking results.

Yellow perch, once very abundant in Lake Erie, especially in Pennsylvania waters, become very scarce and stocking to some extent was undertaken by the State about four years ago. Last year the catch warranted there being placed on a list separately from the miscellaneous fish, the catch being 42,679 pounds or about 33,000 pounds more than yellow pike and with a value of $1,247.02, or about $500 more than the value of the blue pike. This year, however, there was a sharp decline in the catch, it falling to 14,605 pounds or about 900 pounds less than the yellow pike and about $700 less.

An examination of the returns made by each dealer indicates that the chief reason for the falloff is probably that few fishermen set their nets in that part of the lake where the yellow perch frequent. Nearly one-third of the entire catch of yellow perch was made by the boats of one dealer and nearly one-half by two, and these two are men who operate their nets not very far from shore.

Digitized by Google

EEL INDUSTRY.

For the first time since fish baskets have been allowed by law it has been possible to obtain returns from every licensee. Formerly when there was no legal obligation to make such returns, less than half paid any attention to requests for statements, and when an agent was sent to gather the statistics many refused to furnish them. According to the figures returned the catch of eels this year was exceedingly low and unprofitable to the operators of the baskets.

The total catch is given at 186,750, with a weight of 120,078 pounds, and a total value of $11,153.10. There were also caught and returns made of 12,454 suckers and mullets, weighing 7,639 pounds and a value of $419.80, and 922 carp of a weight of 2,362 pounds, and a value of $124.86, or in all 200,126 fish weighing 130,079 pounds and valued at $11,696.76.

There were granted 811 licenses for which the licensees paid $811. It is fair to suppose that the baskets cost to construct, including the wingwalls, at least as much, if not more, than the entire value reported. Of the 811 licenses issued, the owners of 190 reported that they caught nothing. Some that they never operated the device owing to low water. The greatest number of licenses were issued in Lancaster county, and of 110, 25 were not operated. The remaining 85 caught 78,181 eels weighing 20,288 pounds and valued at $1,595.62. The next highest number of licenses was issued in Dauphin county. Of 86 taken out there were 14 which caught nothing. From the 76 remaining the catch was 59,360, with a total weight of 12,039 pounds.

A careful examination of the table will show that the eels caught from the baskets in most of the counties were remarkably small, being commonly known as "whip snappers." Of the 37 counties in which licenses were granted there were only nine, in each of which the total catch is found to average over one pound each. In Dauphin county the average weight is about five to the pound. In Lancaster county about four to the pound. In Mifflin and Perry counties three to the pound. The total catch was less than three-quarters of a pound each.

An examination of the individual returns would give rise to the suspicion that the licensees made errors and returned under weight. For example, one licensee returned 1,500 eels, weight 150 pounds, or about 12 eels to the pound. Another licensee turned in 1,782 eels, weight 138 pounds. Another, 1,500 eels, weight 175 pounds. Another, 1,567 eels, weight 206 pounds. At least 25 per cent. of the licensees reported the weight to be from three to five to the pound. Suspicion, however, of error in returns is dissipated by the large number who return such light weight fish, and also the appearance of the markets in Harrisburg of eels which have every appearance of weighing only a trifle over an ounce.

I am forced, therefore, to the conclusion that the spaces between the slats, as provided by law, are much too small. It is hardly likely that the majority of the licensees deliberately violated the law by attaching some other device to their baskets which would prevent the very small eels from escaping. If they did so in fact there would have been heavier eels also in the baskets, while the returns are almost universally "whip snappers.'

Digitized by Google

The question has even arisen as to what proportion of game fish, or, in fact, any species of fish other than eels, mullets, suckers and carp, find their way in and are caught by the baskets. Many licensees declare that none are caught, while most admit that game fish do get into the baskets, but are returned to the water. One licensee kept a record from October 12th to the 29th, inclusive, and voluntarily brought it to the Department. The basket was very carefully constructed, the slats separated to the full extent of the law and was set in a part of the river in which game fish are not supposed to frequent. The following is the table, with comments, as they were written by the licensee:

1909.	Eels.	Mullets.	Sunfish.	Rock bass.	Chubs.	Shad.	Turtle.	Water dogs.
October 12,	5	3	2	3	------	------	------	------
October 13,	5	0	1	0	------	------	------	------
October 14,	11	5	1	2	------	------	------	------
October 15,	11	5	0	2	------	------	------	------
October 16,	13	4	0	5	------	1	*	------
12.30 gates shut.								
October 17,	0	3	0	2	------	------	------	------
October 18,	3	5	0	3	------	------	------	------
October 19,	0	5	0	3	†	------	------	------
October 20,	11	2	0	4	------	------	------	------
October 21,	9	3	0	0	------	------	------	2
October 22,	2	9	0	4	‡	------	------	------
October 23,	8	6	0	3	§	------	------	------
12.15 gates shut.								
October 24,	1	2	0	1	‖	------	1	------
October 25,	0	1	0	1	1	------	------	------
October 26,	1	3	0	1	------	------	1	------
October 27,	8	4	0	0	------	------	------	------
October 28,	2	6	1	0	------	------	------	1
Total,	90	66	5	34	1	1	2	3

Scale fish of all kinds, excepting three mullets thrown back into the river, turtles thrown back, water dogs killed. Quite a number of small shad went through slats of baskets.

It will be noted that the catch was: Eels 90, mullets 66, sunfish 5, rock bass 34, chubs 1, shad 1, turtles 2, water dogs 3. There were no salmon or black bass. By this table it will be seen that the catch of sunfish and rock bass was very nearly half the catch of the eels. From this it may be safely assumed that baskets set in the course of black bass and salmon must inevitably capture a very large number of those game fishes. The following is the table of the catch of eels, suckers, mullets and carp, together with the value of the same:

*About eight in. long.
†Water fell an inch or so.
‡Water fell again.
§Rain.
‖River raised an inch and a half.

Digitized by Google

	Eels.			Suckers and Mullets.			Carp.			Licenses issued.	Caught nothing.
	Number.	Weight.	Value.	Number.	Weight.	Value.	Number.	Weight.	Value.		
Adams,	153	210	$16 24	0	0	0	0	0	0	4	0
Berks,	59	141	16 92	0	0	0	0	0	0	1	0
Bradford,	17,575	15,266	1,449 39	737	468	$30 39	2	7	$0 82	56	9
Bedford,	9,733	5,096	421 99	1,781	433	27 57	0	0	0	33	5
Blair,	62	74	7 60	6	3	30	1	2	20	2	0
Cambria,	0	0	0	8	4	40	0	0	0	2	2
Centre,	474	665	70 95	68	52	5 50	0	0	0	13	3
Clinton,	1,214	1,079	162 45	462	458	15 20	101	86	5 20	22	6
Clearfield,	1,823	1,044	143 00	752	977	31 99	10	15	1 50	16	3
Chester,	250	130	5 20	6	1	5	0	0	0	1	0
Cameron,	1,178	795	76 19	284	231	24 71	0	0	0	11	2
Cumberland,	5,857	3,222	296 67	83	62	2 75	0	0	0	24	2
Columbia,	666	612	57 08	146	80	5 40	2	10	1 20	18	6
Dauphin,	59,360	12,039	1,093 55	910	375	23 31	28	101	7 83	86	14
Franklin,	138	258	28 30	0	0	0	0	0	0	5	2
Huntingdon,	25,530	7,440	618 23	160	149	10 10	21	86	5 17	50	9
Juniata,	5,394	1,633	120 74	100	104	6 04	1	1½	15	20	4
Lackawanna,	898	744	74 40	25	12	60	0	0	0	3	0
Lehigh,	0	0	0	0	0	0	0	0	0	2	2
Lycoming,	8,412	5,134	571 23	948	419	30 43	205	151	8 80	67	23
Luzerne,	10,507	8,686	995 82	253	136	10 05	3	5	53	28	9
Lancaster,	78,181	20,288	1,595 62	3,332	2,178	102 07	322	1,349	70 14	110	25
Monroe,	35	10	1 00	0	0	0	0	0	0	3	2
Montour,	0	0	0	0	0	0	0	0	0	2	2
Mifflin,	26,569	8,377	744 82	216	117	6 45	145	291	9 51	22	1
Northampton,	235	360	33 10	0	0	0	0	0	0	8	4
Northumberland,	6,566	5,419	503 88	525	297	23 11	24	30	2 80	46	15
Perry,	16,674	5,801	430 75	754	473	33 23	14	32	1 60	37	3
Pike,	2,005	1,000	103 04	48	32	12 60	0	0	0	5	1
Susquehanna,	156	358	24 35	150	75	4 50	0	0	0	2	0
Sullivan,	590	460	40 00	0	0	0	0	0	0	2	0
Snyder,	2,647	1,668	159 12	27	16	1 15	0	0	0	14	0
Tioga,	1,017	1,178	142 60	340	247	9 32	0	0	0	9	1
Union,	3,608	1,791	213 31	65	41	3 34	2	5	56	17	7
Wyoming,	6,078	4,616	420 81	41	38	2 25	0	0	0	13	3
Wayne,	343	262	29 12	0	0	0	0	0	0	9	5
York,	12,768	4,177	345 63	197	161	6 99	46	191	8 85	48	10
	186,750	120,078	$11,153 10	12,454	7,639	$419 80	922	2,362	$124 86	811	190

Digitized by Google

COMMERCIAL HATCHERIES.

Under Sections 11 and 32 of the Act of May 1, 1909, all persons engaged in propagating fish for sale or who catch fish for the market or who are engaged in the sale of fish, must furnish to the Department at the close of each year on demand of the Commissioner of Fisheries, a tabulated statement of their sales of fish and the gross amount of money realized. There were 10 commercial hatcheries for which licenses were issued under the provisions of Section 11, as follows:

License No. 1—Paradise Brook Trout Company, Parkside; trout.

License No. 2—Charles A. Wolters, Oxford and Marvine streets, Philadelphia. Hatchery located at Weissport, Carbon county; trout.

License No. 3—Crystal Spring Brook Trout Company, Port Allegany, McKean county; trout.

License No. 4—Hiram Peoples, New Providence, Lancaster county; black bass, blue gill bream, gold fish.

License No. 5—Penn Forest Brook Trout Company, Mauch Chunk, Carbon county; trout.

License No. 6—Hayes Creek Brook Trout Company, Freeland, Luzerne county; trout.

License No. 7—Harry C. Trexler, Allentown, Lehigh county; trout.

License No. 8—J. H. Storch, East Smithfield, Bradford county; carp, bullheads, pickerel, bass and pike.

License No. 9—R. S. Kemmerer, Route 1, Bowmanstown, Carbon county; trout.

License No. 10—H. J. Westcott, Conneaut Lake, Crawford county; gold fish.

Of the 10 licenses, seven were for trout hatcheries, of which six had voluntarily in previous years furnished the Department with the gross amount of their sales for statistical purposes. The seventh was a plant established since the new law went into effect. The reports received from the commercial hatcheries indicate generally a healthy condition of the business. The total sales of the 10 hatcheries amounted to $34,638.56, of which $33,825.36 were by the trout hatcheries. The hatcheries for other fish only aggregated $813.20, but the plants were either very small or had been newly established. Tabulated, the business for the year was as follows:

	Number.	Weight.	Value.
Gold fish,	19,224		$501 00
Catfish,	800	400	24 00
Carp,	300	600	36 00
Black bass,	1,855		37 00
Sunfish,	7,550		215 20
Total,			$813 20

Digitized by Google

BROOK TROUT.

	Number.	Weight.	Value.
For market,	61,020	37,790¾	$17,842 05
Live trout fingerlings and yearlings,	291 569	.....	11,594 46
Eggs,	11,333,697	.....	4,388 85
Total,	11,686,286	37,790¾	$33,825 36

SUMMARY.

Brook trout,	$33,825 36
Miscellaneous fish,	813 20
Total,	$34,638 56

Comparing the trout business with that of 1908 it will be seen that there was apparently a fall off in business. In 1908 the total business was $38,396.72, but a comparison of this kind in this report is hardly just, for the reason that in 1908 the business was for the entire calendar year from January 1st to December 31st, inclusive, while this year the business reported is from January 1, 1909, to November 30th, inclusive.

Several of the owners of the commercial hatcheries reported that their orders for December were very heavy, considerably exceeding those of December, 1908. In 1908 also the eggs of the trout were taken earlier and were for sale, and many deliveries were made before December 1st, while this year the eggs came much later and only a small proportion of the orders had been filled on December 1st.

In the returns made, one concern has charged up 1,300,000 green eggs, which were turned over to the State for fish from one of the hatcheries, with which to change blood, in accordance with Section 11 of the Act. Another firm furnished the State three million eggs on the same terms, but those eggs were not delivered until December, hence they do not appear on the returns. A fairer comparison of the trout business would be with the year 1906, when the business was $29,951.00.

There is reason to believe that the sales of goldfish returned do not represent the business of the State in this fish during 1909. There are several plants, the knowledge of the existence of which have only recently come to the Department, and the owners of which were probably unaware of the provisions of the new law and were not licensed during 1909. It is reported that one of these concerns alone does a business many times as large as the hatcheries which were licensed.

An encouraging feature of the commercial hatchery business is the attention which is being given to the rearing of other fish than brook trout, and there is reason to believe that this business, particularly the hatching and selling of black bass, will be largely increased during 1910, and that at least one additional commercial hatchery for this fish will be in operation.

The 10 licensed hatcheries embraced in all 3,825½ acres, with six hatching houses, 272 hatching troughs, and 206 ponds. Of course, all the acreage is not devoted to ponds, the total acreage of water probably not being much over 200 acres.

Digitized by Google

COMMERCIAL FISH BUSINESS IN THE STATE.

Under the provisions of Section 32 of the Act of May 1, 1909, all persons engaged in catching fish for the market or who may be engaged in the sale of fish, shall on demand of the Commissioner of Fisheries, furnish at the close of each year a tabulated statement of their sales of fish and the gross amount of money realized, to be used by the Department of Fisheries for statistical purposes.

This being the first year that such a law has been on the statute books it was difficult, with the limited means at my command, to either secure the names of all the persons dealing in fish or in every case to enforce the provisions, even where the names were known. Hence, the figures which are here presented do not begin to represent a tithe of the fish industry of the State.

There were but 23 returns of wholesalers and retailers altogether and there are more wholesalers than that in the city of Philadelphia alone. The wholesale dealers in carp would themselves exceed this number. There were 10 returns of Philadelphia wholesalers and five from Pittsburgh. The other eight were retail dealers in Wilkes-Barre, Scranton, Carbondale and Towanda. A disastrous fire, which destroyed the Diamond market, caused the loss of the books of nearly every wholesaler in Pittsburgh, and while they all endeavored to make returns they are very incomplete and largely guess work, though admittedly below what was the actual business. Under the circumstances, the number being so small, I would not publish the totals were it not for the fact that they are faintly indicative of a business much larger than the public supposes. I trust next year to have a complete account of the business, both wholesale and retail, in Pennsylvania.

The 10 wholesale houses in Philadelphia and Chester making reports did a business of $346,757.28. Pittsburgh's business, of the five who made returns and which were both wholesale and retail, amounted to $202,087.00. The other eight, which were both wholesale and retail, made returns amounting to $20,824.32. This was practically all retail, although there may have been a small amount sold at wholesale rates.

From these figures it is safe to say that the retail business in fish in Pennsylvania will amount, outside of Philadelphia, Pittsburgh, Scranton and Erie, to at least $800,000. Scanning the list of the eight returns in the interior part of the State, it is seen that three-fourths of the fish sold came from either Lake Erie or waters in Pennsylvania.

Of the sales reported by Philadelphia houses, 952,237 pounds, valued at $95,742.58, came from waters other than Lake Erie and mostly from the Delaware river, the Chesapeake and North Carolina. The particularly interesting features are the shad and carp. The returns for shad were 689,253 pounds, valued at $80,606.90, and of this amount 2,500 pounds were marked as North Carolinas. The carp reported was 42,199 pounds, valued at $3,853.10.

If to the returns as given could be added the business of the remaining wholesale houses in Philadelphia and Chester and the sales of shad in Wilmington, Easton, Stroudsburg, Trenton, Camden, Washington

Digitized by Google

Park and other towns and villages of lesser size on the Delaware were reported, it is probable that the value of the shad industry from the Delaware river would be shown to have been, in 1909, at least $200,000. The reported carp business, 42,199 pounds, valued at $3,853.10, does not begin to represent the sales of that fish in Philadelphia. It is safe to say that more than four times 42,000 pounds of carp were sent into Philadelphia from the State of Illinois in 1909. The weight given will scarcely represent the carp caught in the Delaware and its tributaries. The following is the table of the number of pounds and the value of the fish caught in waters other than Lake Erie as reported by the 10 Philadelphia and Chester houses:

Name of Fish.	Pounds.	Value.
Carp,	42,199	$3,853 10
Yellow perch,	12,600	618 00
Rock fish,	2,155	215 50
Eels,	10,462	667 00
Sturgeon,	36,484	4,201 18
White perch,	7,000	590 00
Alewife and herring,	87,524	463 90
Catfish,	41,260	3,373 00
Shad,	689,253	80,606 90
Total,	952,237	$95,742 58

The amount and value of Lake Erie fish sold in Philadelphia and Chester by the 10 houses reported were as follows:

Name of Fish.	Pounds.	Value.
Yellow pike,	6,000	$440 00
Blue pike,	19,456	979 00
Lake trout,	600	36 00
White fish,	8,500	920 00
Ciscoes or lake herring,	317,992	15,762 00
Total,	352,548	18,137 00

The salt water fish returned by the 10 dealers were as follows:

Name of Fish.	Pounds.	Value.
Miscellaneous salt water fish,	5,790,850	$229,507 70
Black and sea bass,	76,500	3,370 00
Total,	5,867,350	$232,877 70

Virtually all the fish sold in the Pittsburgh markets came from Lake Erie, the Delaware, Chesapeake and waters in the State of Illinois. Out of the entire list probably a few carp only were caught

Digitized by Google

from Pennsylvania waters contiguous to Pittsburgh. The following is the table reported by the five Pittsburgh dealers:

Name of Fish.	Pounds.	Value.
Halibut,	30,000	$2,700 00
Bass,	13,100	1,984 00
Catfish,	9,200	925 00
Ciscoes or lake herring,	502,000	34,760 00
Yellow pike,	120,000	10,890 00
Blue pike,	716,000	46,880 00
Lake trout,	34,450	4,094 00
White fish,	251,800	24,604 00
Shad,	21,600	6,210 00
Carp,	127,000	6,120 00
Yellow perch,	88,200	5,510 00
Eels,	12,500	1,160 00
Miscellaneous fresh water fish,	45,000	2,750 00
Miscellaneous salt water fish,	420,000	38,500 00
Estimate of one firm burned,	----------	15,000 00
Total,	2,390,850	202,087 00

It is impossible to tabulate the eight returns from other parts of the State for the reason that some not understanding, while they gave the number of pounds failed to give the value of each, giving only the total values. The figures are, therefore, of no importance.

The following table is a summary of the commercial fish industry of Lake Erie, commercial hatcheries and the Delaware river as given above, and the eel industry of the Susquehanna:

Name.	Pounds.	Value.
Delaware river,	952,237	$95,742 58
Lake Erie,	10,904,617	284,822 11
Commercial hatcheries,	37,790	17,842 05
Live trout and trout eggs,	----------	15,983 31
Fish basket industry,	130,079	11,696 76
Total,	12,024,723	$311,696 86

FINANCIAL STATEMENT.

The following is a statement of the receipts and expenditures of the Department of Fisheries for the year ending November 30, 1909:

HATCHERIES.				
Received from State Treasurer,	$37,708 26			
Balance on hand from Lake Erie licenses,	91 56			
Balance on hand from fines,	503 22	$38,303 04		
Paid for hatcheries,	----------	----------	$37,708 26	
Balance on hand,	----------	----------	----------	$594 78
WARDENS.				
Received from State Treasurer,	$11,807 00			
Balance on hand from eel licenses,	49 23	$11,856 23		
Paid for wardens,	----------	----------	$11,807 00	
Balance on hand,	----------	----------	----------	$49.23

Digitized by Google

FINANCIAL STATEMENT—Continued.

CONTINGENT FUND.				
Balance on hand Dec. 1, 1908,		$56.76		
Received from State Treasurer,		1,000 00	$1,056 76	
Paid for incidental expenses,				$1,056 76
EXPENSES OF FISHERIES COMMISSION.				
Received from State Treasurer,		$1,092 51		
Paid for expenses,				$1,092 51
COUNSEL FEES AND COURT EXPENSES.				
Received from State Treasurer,		$535 95		
Paid for fees and expenses,				$535 95
OPERATION OF COMMODORE PERRY.				
Received from State Treasurer,		$3,924 27		
Paid for operation,				$3,924 27
COMPLETING HATCHERIES.				
Received from State Treasurer,		$9,955 12		
Paid for work,				$9,955 12
FIELD WORK.				
Received from State Treasurer,		$1,284 90		
Paid for field work,				$1,284 90
PURCHASE OF GROUND.				
Received from State Treasurer,		$2,484 61		
Paid for lot in Erie,	$2,450 00			
Brief of title,	10 00			
Recording deed,	2 00			
Advertising,	16 63			
Taxes,	5 98			$2,484 61
GATHERING SHAD SPAWN.				
Received from State Treasurer,		$500 00		
Paid for gathering spawn,				$500 00
ERECTION OF FISHWAYS.				
Received from State Treasurer,		$5,359 62		
Greenville fishway,	$3,750 00			
Lanesboro fishway,	1,500 00			
Advertising and inspection,	109 62			$5,359 62

During the year there were receipts from various sources as follows, the same paid into the State Treasury daily in accordance with the Statute.

Fines for violations of the fish law,	$3,674 06
Licenses for eel baskets,	789 26
Lake Erie licenses,	1,534 00
Licenses for commercial hatcheries,	100 00
Licenses for shad seines,	72 20
Property sold,	125 00
Confiscated fish and devices sold,	2 75
	$6,297 27

Digitized by Google

ITEMIZED EXPENSES OF HATCHERIES.

The following is the itemized account of the expenses of the various hatcheries for the year ending November 30, 1909:

	Salaries.	Labor.	Travel.	Material.	Food.	Incidentals.	Water Rent.	Total.
Bellefonte,	$3,517 50	$749 48	$366 93	$2,227 39	$1,461 62	$369 27		$8,692 19
Crawford,	2,570 00	1,187 63	200 79	1,909 00	142 91	465 85		6,476 18
Corry,	2,875 00	320 85	368 93	516 24	865 47	199 55		5,146 04
Erie,	1,630 00	1,768 23	375 46	371 26		46 51	$400 00	4,591 46
Erie Auxiliary,	2,717 50	429 52	396 27	798 56	69 17	188 77		4,599 79
Spruce Creek,	2,429 72	392 80	539 17	1,373 17	746 02	405 14		5,886 02
Torresdale,	2,592 50	796 37	896 11	743 59	143 71	678 77		5,851 05
Wayne,	2,075 00	1,725 26	730 94	1,036 35	464 29	708 30		6,740 14
General expenses,								180 51
	$20,407 22	$7,370 14	$3,874 60	$8,975 56	$3,893 19	$3,062 16	$400 00	$48,163 38

Digitized by Google

WORK IN THE HATCHERIES.

An unusual amount of work was accomplished on the different hatcheries. Numerous improvements were made, which will, in the near future, augment the output of fish. Several buildings were erected, among them two new hatching houses, one new assistant's dwelling house, one enlargement of a dwelling house for a Superintendent, battery capacity increased by nearly 300 jars, three ice houses built and one meat house, one large bass pond constructed, a huge perch pond started last year nearly completed, two trout ponds as large as the earlier bass ponds built, more than a dozen trout ponds for yearlings and two-year-olds constructed and several fry ponds for warm water fish. An additional plot of ground with a dwelling house for use of Superintendent was also secured.

The two new hatching houses will enable an increased output of trout by nearly 5,000,000. The increased battery capacity will make possible an increased output of more than 200,000,000 food fish like lake herring and white fish, and at least, if not more, of game fish like pike-perch, pickerel and yellow perch. The increased number of trout ponds will add, in the near future, about 12,000,000 trout eggs, perhaps more. The new bass pond will add more than a half million bass to the annual output. The new Assistant's house will enable the Department to have an additional man on the hatchery where it is located at all times, night and day, ready for call instead of his being more than a mile from his work. The new ice houses will save a heavy annual purchase of ice for use when shipping fish. These improvements were all made at the cost of $10,000. The new trout ponds at two of the hatcheries were built of concrete. At the third, wooden sides were used for immediate economy, rendered necessary through the small amount of money available and the prompt completion of the ponds needed to accommodate stock on hand.

The foregoing is classed as new work. In addition many old ponds were repaired and their capacity increased, grounds were graded, trees set out, the properties otherwise made more sightly for visitors, and, in one instance, electric lamps were installed for the purpose of lighting the grounds and hatching house at night.

CORRY HATCHERY NO. 1.

The work of restoring and enlarging the capacity of the trout ponds at the Corry Hatchery was continued during the year and nearly completed.

Corry Station is the oldest in the State. It was established at a time when fish culture was yet, comparatively speaking, in its infancy in the United States. Little was known at the time of pond construction beyond digging a hole in the ground and filling it with spring water, providing for an inlet and an outlet. As a consequence, the ponds at the Corry Hatchery are of all shapes and sizes, located here

Digitized by Google

and there over the grounds without much regard to economy of space or the best utilization of the water. The sides were boards without even precautions having been taken to paint them with asphaltum. The character of the ground is soft and damp. In course of time the boards began to rot and were pushed out of alignment until finally there was not a pond out of the some fifty on the property that would hold half the proper number of fish. There being very little money available by the old Fish Commission, the place, when it passed into the hands of the Department of Fisheries, was in a dilapidated condition and almost an eyesore. As soon as possible I began work of reconstruction, which was more difficult than the building of a new place. Fortunately, the superintendent is a man of knowledge and intelligence. The lines of the ponds were redrawn, walls constructed of concrete or tile, or both, and a proper drainage system installed. At the close of the year the reconstruction of the old grounds was practically completed, and, with the exception of walks and drives, the grounds have an attractive and trim appearance. The ponds, which in their days of dilapidation did not hold more than 50,000 or 60,000 trout of all sizes, now have the capacity of more than three times those numbers.

In addition, on a piece of ground purchased in 1908, a pond nearly two hundred feet long and eighty-five feet wide and five feet deep has been built to hold trout of three-year-old and over. It has been found that the ordinary trout ponds found on Government Hatcheries, State and National, are not large enough to carry many fish of that age. To insure health and prolongation of life at least one large body of water has been found almost essential. The new pond at Corry it is believed will carry 15,000 or 20,000 trout of three-year-old and over. Assuming this to be correct, this one pond alone should add close up to 5,000,000 eggs to the capacity of the Corry Station by 1911. The capacity this year was about 5,000,000 eggs.

In addition, two of the three ponds built several years ago on the Corry Hatchery for experimental work in bass culture were overhauled, repaired, redesigned for catfish culture, the only other fish than trout to be propagated at this station. No diseases of any kind attacked the fish during the year.

ERIE HATCHERY NO. 2.

The Erie Hatchery is the second oldest fish hatchery property in the State. It is also the smallest in area. It is situated on the corner of Second and Sassafras streets in the city of Erie, and until this year was only 80 x 80 feet. An appropriation by the Legislature enabled me to purchase an additional property about the same size, with a frame dwelling erected thereon. The purpose of the purchase was to provide a dwelling place for the Superintendent so that he could be on the property at all times when needed. This is a matter of very great importance as there are periods when it would be dangerous for the Superintendent to be absent or far away either night or day. It was the only property that did not possess a Superintendent's dwelling.

Digitized by Google

The Erie Hatchery is designed exclusively for the propagation of lake fish like white fish, lake herring, pike-perch, blue pike and yellow perch, and is fitted up with two batteries having a total capacity a little less than 550 jars. As the building itself was constructed about thirty years ago of frame, it is, through constant dampness, in an advanced state of decay, and, as its capacity is less than the requirements of the time only the most urgent repairs were made because a new building of a more permanent type and greater capacity will be required very shortly. To accommodate a larger building it will be desirable to purchase another adjacent property. The new hatching house should be able to accommodate at least three batteries with an aggregate capacity of 1,500 jars and tank room enough to hold the millions of fish which the jars can accommodate.

BELLEFONTE HATCHERY NO. 3.

Very many improvements and extensions were made at the Bellefonte Hatchery and to-day it probably ranks among the largest for stock capacity in the United States. It has more than sixty ponds of different sizes conveniently arranged and with a perfect drainage system. The ponds are built of concrete and are splendidly adapted for the rearing of trout. Nearly 5,000,000 eggs were taken from the stock this year and a number of new ponds having been constructed the take should be appreciably increased next year. The one hatching house erected in 1903 has been for two years insufficient for the proper rearing of trout for distribution. A new building was, therefore, erected this year capable of carrying about 3,000,000 fish to the age of three to four months. It is one hundred feet long and forty feet wide with the troughs so arranged that no more water is consumed by the two houses than was formerly necessary for the one house. The building is of frame, set upon concrete walls and has a concrete floor with an ample sewerage system. A large reservoir to supply water to turn the wheel which operates the meat grinding machine was also built. By the construction of this reservoir it is now possible to grind in one hour meat sufficient to feed the fish which formerly required three hours by hand labor.

The construction of about five more ponds of the usual size and one large pond for three-year-old trout will complete one section of the Bellefonte Hatchery. These ponds, it is hoped, will be finished next summer so that a beginning may be made in pond construction in the second section of the property in 1911. The water supply at the Bellefonte Hatchery was diminished by several hundred gallons per minute through the drought, but the quantity remaining was ample for the operation of the station and at no time was the danger point reached. I am expecting a further diminution in 1910 in the water supply at this station owing to the drought this year and last, but I still believe the supply will be sufficient for all purposes.

Digitized by Google

WAYNE HATCHERY NO. 4.

I regret to say that the drought practically put the Wayne Hatchery out of business this autumn, and the outlook for trout work, until normal conditions return or an additional supply of spring water can be added, is not encouraging. The hatchery has a spring, which, under ordinary conditions, flows about four hundred gallons of water per minute of a temperature of 46 degrees the year round. In addition there is a stream (the headwaters of the Lackawaxen) which, in ordinary low water, would fill a 16-inch pipe. On the 30th of November the spring had diminished to about ten gallons of water a minute and the stream would not fill a four-inch pipe gravity flow. As these conditions appeared about the first of September there was not sufficient water to keep the adult trout healthy. The water temperature rose, the fish contracted fungus and hundreds of them died. The few which survived were too weak and in such poor condition that when spawning time arrived the eggs proved to be no good and the milt without fertilization power. Eggs were secured by a gift from the Paradise Brook Trout Company, but although more eggs could have been secured it was not safe to put into the hatching troughs more than 1,000,000. On account of the low water in the spring and stream and the possibility that a normal supply would not be had from the former for at least a year or two, I decided to drive a deep well in the hopes of securing water, either as an artesian or by pumpage. It is reasonably supposed that when this well is completed, as it will be before the first of January, by this means a steady supply of about one hundred and fifty gallons per minute will be secured. This amount should be obtained at a depth not exceeding two hundred and fifty feet, as other wells in that neighborhood have yielded that amount. There is little hope that a flowing well will reward the effort. Should pumpage be necessary the well will not be available until 1911 and after money has been secured to install a pumping apparatus.

A huge pond, covering nearly two acres, for brood yellow perch was started on this property in 1908. Water was introduced in the autumn although notwithstanding it was not nearly finished and from it about 25,000,000 perch eggs were taken this spring. As soon as the spring distribution of the hatchery was over the brood fish were transferred to another pond, the water drawn off and construction resumed. Although efforts were made it was not completed by the time frost set in, about six weeks' work being still required to finish it. The pond is about one-tenth of a mile long and is from about eighty to two hundred feet wide. Its greatest depth will be ten feet in the kettle and about three feet in the shoals. It will have a capacity for about 200,000,000 yellow perch eggs when completed or about the annual output of all the hatcheries for that fish.

Digitized by Google

TORRESDALE HATCHERY NO. 5.

Torresdale Hatchery No. 5 is nearly completed as far as ponds and drainage is concerned. There remains only to be done the landscape engineering and the replacing as nearly as may be practicable the present unsightly hatching house with one more up to date and ornate. Through the courtesy of the Director of Public Safety the Superintendent of the hatchery, Mr. Berkhous, was enabled to utilize labor from the House of Correction in the construction of ponds and the completion of the important drainage system. Through the laying of very large terra cotta pipes from the upper end of the sturgeon pond to the river all danger of floods from the stream which flows through the ground has been eliminated and a more perfect control over all the ponds in the place has been the result.

Electric lights were also installed. This became necessary owing to the number of predatory night birds and the incursions of some conscienceless persons who, on two or three occasions, succeeded in seining the bass pond and getting away without being captured. The lights were also badly needed in the hatching house to replace the dim oil lamps which have been there for years.

Three new large ponds were built to meet the growing demand for catfish and some other warm water species. The output from the hatchery was 156,801,182, an increase of 47,609,000. The most important addition to the output at the Torresdale Hatchery was in shad. There were about 5,500,000 more than the previous year.

Owing to the character of the pond and some other constructions it was deemed best to abandon the cultivation of small mouth bass at this hatchery and for the Superintendent to devote his attention exclusively to the propagation of the large mouth. This decision was aided by the curious fact that the applications for large mouth bass from that section of the State is greater than for small mouth.

ERIE AUXILIARY HATCHERY NO. 6.

The output from the Erie Auxiliary footed up 103,634,300. The most important work, though perhaps not the largest at the Erie Auxiliary, commonly called the Union City Hatchery, was in the rearing of small mouth bass. The Superintendent, Mr. A. G. Buller, has developed great skill in the propagation of this species of fish and this skill is evidenced by the fact that from 10 nests he reared 50,000 fish to a size fit to be shipped.

At the close of the previous year a battery house was erected and that was put in operation on the second of December, it carrying surplus lake herring and white fish eggs, and in the spring nearly 60,000 pike-perch eggs and also many million yellow perch and pickerel eggs from the field in Wayne county. Through these various means the output of the Erie Auxiliary was increased from 26,690,813, in 1908, to 103,634,300 in the present year.

Digitized by Google

Much satisfactory experimental work, especially with black bass and sunfish rearing, was conducted by the Superintendent, chief among which was a fair determination of the extent of cannibalism among small mouth bass in one year. In September 1,000 fish of this species, averaging about three inches in length, were placed in a pond about one hundred feet square. Although they were fed regularly and a generous supply of small minnows in addition put in this pond, when it was seined in the spring there were but 479 bass left. More than half had been devoured. This was in the month of April. Early in August the pond was again netted and only 283 bass were found, nearly two hundred having been eaten in three months. Altogether there was a loss of 717 fish out of 1,000 in less than one year.

In addition to the regular hatchery work, the grounds of the station were graded, retaining walls built in the stream which flows through the property, trees planted and other improvements made, which makes the station to-day one of the very attractive hatcheries under the control of the Department.

CRAWFORD HATCHERY NO. 7.

Possibly the greatest number of improvements were made at the Crawford Hatchery. The pond area was practically doubled, new buildings erected and a comprehensive drainage system, began with the establishment of the hatchery, was finished so far as the first section is concerned. With increased experience it became evident that ponds which had previously been constructed for black bass rearing were as large as they should be to obtain the best results. Plans were therefore drawn for one on this station to occupy nearly two acres. This building required three months and five days and cost $829.05, and required the moving of 9,139 cubic yards of earth. It is estimated that it should have a capacity for hatching at least a quarter of a million young bass. The output of the station was 91,385,900, while most of these were wall-eyed pike, yellow perch and pickerel, the most important output was 69,500 black bass produced from 23 nests.

For the second time a small spring run flowing at right angles through the grounds and emptying into Conneaut Lake outlet creek went dry on account of the drought. This stream which easily fills a four inch pipe, under pressure is depended upon to operate the battery hatching house, as a consequence it was impossible this year again to hatch any white fish or herring eggs. While the drought also affected the supply from Conneaut Lake outlet creek, at no time was there danger from a lack of water. Much time was expended by the improvement of the grounds, grading, sodding and otherwise beautifying.

Digitized by Google

SPRUCE CREEK HATCHERY NO. 8.

While the drought diminished the supply of water in the spring there was more than enough for the use of the hatcheries. Indeed, some new springs have been discovered which promise to add materially to avail spring water, perhaps enough to furnish another hatching house. Certainly enough to supply a large trout pond covering three-fourths of an acre built during the year.

The specific purpose of this pond is for lake trout, it having been found that this species require plenty of room in order to reach normal size. Four years ago it was plainly seen that the successful gathering of lake trout eggs from Lake Erie was uncertain, storms and an indifference on the part of fishermen to hunt for this particular species making it very uncertain whether any quantity of eggs could be secured. It was then determined to rear enough fish in the trout hatcheries to produce at least two million or three million eggs.

On the establishment of the Spruce Creek hatchery it was selected as one of the places adapted for raising lake trout on account of the great abundance of water. There are now several hundred four-year-old fish which will spawn next year, and it was to accommodate these and others coming on that the large pond already noted was built.

The output of fish at Spruce Creek was the smallest of any hatchery in the State, it being only 585,625, of which 510,325 were brook trout. The Superintendent experienced considerable trouble with his eggs, rearing very little over 50 per cent. of those laid down. Some of the trouble was with the eggs themselves received from outside sources, but the chief cause was undoubtedly due to the Superintendent's lack of familiarity with the water itself.

In addition to the large lake trout pond there were constructed at the Spruce Creek hatchery during the year 10 ponds for trout, 60 feet long and 22 feet wide each, and, although the station is only three years old, it now contains 1,400 four-year-old trout, 2,000 three-year-olds, 6,000 two-year-olds, 4,500 yearlings and, in addition, 2,000 two-year-old trout, 2,000 two-year-old lake trout, 2,000 yearlings and 1,500 yearling brown trout and 7,000 silver salmon nine months old.

FIELD WORK.

Our field work has reached huge proportions. Of the more than one billion fish hatched at the various stations fully nine-tenths are from eggs secured by field work. All of the white fish, pike-perch, herring, shad, blue pike and pickerel were obtained in this manner and all but about ninety millions of yellow perch eggs were from the same source. To and including 1909, all of the white fish eggs, excepting three millions in 1909, came from the Ohio end of Lake Erie through the United States Bureau of Fisheries, the State paying the pro rata cost of gathering. This year all the fertile white fish eggs were gathered by our own field men in Pennsylvania and Canadian waters.

Digitized by Google

This extension of the work was fortunate since owing to climatic and other conditions the eggs gathered from Ohio waters this year by the United States authorities were all bad. Field work is, therefore, to-day the most important division of the Department's work and, apart from the labor of gathering the eggs, is inexpensive. With sufficient money we could double the quantity of eggs to-day put in the hatching house without increasing the cost of hatching to an appreciable degree and without any burdensome cost of extending the hatching house. Any increase in this work is of importance since every egg gathered from the commercial nets is an egg saved from destruction, and 95 per cent. of the eggs gathered when naturally deposited are saved from loss.

Our appropriation for field work ought to be doubled. As an illustration of what could be done by increasing the appropriation, it might be noted that every white fish, lake herring and blue pike fishing grounds in Pennsylvania waters and Canadian waters from the extreme eastern end to a point nearly opposite Cleveland, Ohio, could be handled by the Department of Fisheries. This year it was only possible, under the appropriation, to handle a portion of the fisheries at Nanticoke and Port Stanley, Canada, in addition to the Erie fishing grounds. Although we had the freedom of it, we were unable to enter and take any eggs from either the Ashtabula or Cleveland, Ohio, grounds. Our field work in the northeastern part of Pennsylvania has been necessarily confined to less than twenty lakes out of nearly three hundred. With $10,000 we could do what I have stated on Lake Erie and, in addition, cover nearly one hundred lakes in Wayne and Susquehanna counties and raise our output fivefold. We could, moreover, increase the output of black bass at least that much.

FISH CAR.

The State owns a car for the transportation of fish to applicants. It was built on the lines of a passenger coach with the weight and general character of a Pullman, but, instead of seats, was fitted up with tanks and space for cans and with ice chests, even sleeping-berths and kitchen. Owing to a lack of sufficient appropriation it has not been possible to operate the car excessively, and last year it made but one trip.

Arrangements have been made with the various railroad companies by which it can be made use of more frequently in 1910. The outputs from the various hatcheries have reached such a point that it is now rather difficult for the fish to be carried in the baggage cars without interfering with the business of the railroad companies, and, indeed, the baggage car service is entirely insufficient to move the fish from the hatcheries to the applicants rapidly and economically even with the railroad companies carrying the fish as they do, without any charge to the State.

Fifty cans of fish is the limit originally allowed to be carried in the baggage car. It very frequently happens that on a single route there are to go from two hundred to two hundred and fifty cans, or often more. In consequence of the limit to 50, that means that three

Digitized by Google

or four or often more trips are necessary with the additional carfare. If the car were run, from three hundred to three hundred and fifty cans could be sent out at one time. It will, I believe, be necessary before very long to entirely revise our method of shipping fish; that while we may use the baggage cars as heretofore, the bulk of the fish will have to go out in cars specially built for them. One new fish car is therefore urgently needed and it is advisable that there be a third before many years.

The car now owned by the State will need some few repairs. It is kept in a barn especially built for it on the Bellefonte hatchery.

THE COMMODORE PERRY.

The steam tug built for the Department of Fisheries for use on Lake Erie has proven to be invaluable. By its use illegal net fishing and larceny of fish from licensed nets have become exceedingly rare. It has also secured fish and fish eggs more readily and accurately than was before possible. In addition to its usefulness to the Department of Fisheries the "Commodore Perry" has performed invaluable service in other directions. Through its use two disabled vessels were saved from loss and their crews from death and the captain and crew have proven themselves heroes. In April a terrible storm swept over Lake Erie while many tugs were on the fishing grounds. All hurried to port with the exception of three. Two were seen and were evidently disabled. Notwithstanding the fury of the tempest Captain Driscoll and his crew drove the Commodore Perry out into the raging lake and succeeded in bringing in both without the loss of a single man. To do this two trips were necessary. The third vessel, which was the fishing tug "Floss," with Captain William Barry and six men, could not be seen and before the storm abated the staunchest boats, headed by the "Commodore Perry' went out in search of her. The "Floss" was finally located sunken and a week or two later the "Commodore Perry" found the body of one who had been aboard her. The remaining unfortunates were afterwards found by other boats. The conspicuous bravery exhibited by Captain Driscoll and his crew in venturing out into what was conceded the most furious storm on Lake Erie in many years, and the success in saving two boats and their crews, excited general admiration even among the sailors of the Great Lakes, where heroism is common, and the Board of Fishery Commission at its June meeting adopted resolutions expressing their appreciation of the bravery of these employees of the Department of Fisheries, and the resolutions were presented to Captain Driscoll by His Excellency, Governor Edwin S. Stuart.

By this storm the staunchness of the "Commodore Perry" was amply demonstrated.

During the early spring the "Commodore Perry" made one important seizure of nets in Lake Erie. They belonged to a resident of New York, who was fishing them without having paid a license, and the nets were likewise of illegal mesh. The owners and operators escaped with their vessel, but the nets were captured and destroyed. There were found in the nets eight hundred pounds of blue-pike and these were distributed to the following public institutions:

Digitized by Google

Hamot Hospital, Second and State streets, Erie, Pa.

St. Vincent's Hospital, Twenty-fourth and Sassafras streets, Erie, Pa.

Home for Friendless, Twenty-second and Sassafras streets, Erie, Pa.

St. Joseph's Orphan Asylum, East Third street, Erie, Pa.

St. Mary's Home, Twenty-fifth and Ash streets, Erie, Pa.

Old Ladies' Home, Sassafras between Twenty-second and Twenty-third streets, Erie, Pa.

Lutheran Home for Aged, Twenty-second and Sassafras streets, Erie, Pa.

Villa Maria Academy, West Eighth street, Erie, Pa.

Although occurring after November 30th, I feel that I ought to here, while the subject is fresh, add another splendid achievement of Captain Driscoll and his crew with the "Commodore Perry." On Tuesday, December 7th, the car ferry, Bessemer and Marquette No. 2, belonging to the Bessemer Railroad Company, left Conneaut, Ohio, in the midst of a great storm and started on her trip across the lake to Port Stanley, Canada. The vessel was nearly four hundred feet long and considered staunch enough to outlive the most violent tempest that Lake Erie could produce, yet at some point, probably through an accident, the boat foundered.

There were 38 persons, passengers and crew, on board, and all lost their lives. Among the passengers was Mr. Albert J. Weiss, treasurer of the Keystone Fish Company of Erie. The car ferry not appearing at Port Stanley within a reasonable time alarm was felt for her safety and a number of the staunchest tugs on Lake Erie were sent out from Erie and Conneaut in seach of her. The storm was still heavy and the temperature below the zero point, and, in fact, a blizzard was raging.

Among the tugs which were engaged in the search was the "Commodore Perry," and after the lapse of about forty-eight hours Captain Driscoll ran into considerable wreckage, including hatches, chairs, tables and other articles from the car ferry. On Sunday morning, December 12th, about 11 o'clock Captain Driscoll sighted a dark blotch far out on the waters, which, on nearer approach, turned out to be a green ten-man lifeboat heavily laden and lying low in the water. Sitting and lying in this boat were nine dead men. The bodies and clothing were frozen stiff.

The sea was running so heavily that it was impossible to transfer the bodies to the "Commodore Perry" and after much difficulty and danger the boat was made fast by a towline. The "Commodore Perry" was then headed for Erie with flags floating at half mast. The sea rolled the Perry and the boat with its gruesome burden heavily, and the one deck hand was forced to use a pike pole steadily to fend the yawl from the Perry and keep her right side up. The bodies afterwards were identified as residents of Conneaut, Ohio, and members of the illfated car ferry. I was notified by telegraph of the disaster and of the finding of the bodies.

I brought the matter to the attention of the Board of Fishery Commission and it directed me to express to Captain Driscoll and the crew its appreciation of their heroism and to make a record thereof in the annual report. The following was sent in accordance therewith to Captain Driscoll and the crew and delivered by Commissioner John Hamberger, with proper formality:

Digitized by Google

To Captain Jerry R. Driscoll and Crew of the Commodore Perry:

Greeting: The Board of Fishery Commission has directed me to express to you, Captain Driscoll, and to your crew, its high appreciation of the splendid services rendered during the year with the Commodore Perry. On several occasions you and your crew heroically took the Department's vessel out during stormy weather in the cause of humanity, saved a number of human lives and boats, and found and brought in bodies of those who had lost their lives in the tempests. The latest feat of recovering nine bodies of those lost by the sinking of the illfated car ferry is a brilliant climax to a year's record to yourself and crew and gives lustre to the work of the Department of Fisheries.

The Board of Fishery Commission here expresses its profound gratification in having men of your stamp in the employ of the Department of Fisheries.

W. E. MEEHAN,
Commissioner of Fisheries,
President of the Board of Fishery Commission.

Harrisburg, Pa., December 25, 1909.

The exploit of Captain Driscoll and his crew was considered of such a high character that the Councils of Erie unanimously gave him and crew a vote of thanks by resolution entitled, "A resolution of thanks to Captain Driscoll and crew of the Pennsylvania fish tug, the 'Commodore Perry,' for saving lives and property." The following is a copy of the resolution and the minute as recorded on the journals of the Select and Common Councils of the City of Erie:

"Resolved, by the Select and Common Councils of the City of Erie, That the thanks of the citizens of Erie be, and they are hereby extended to Captain Jerry Driscoll and the crew of the Pennsylvania Fish Commission tug Commodore Perry for the valuable services rendered during the fall season in saving lives and valuable property owned by the people of Erie and other lake ports, such bravery and heroism is worthy of the highest commendation.

Select Council adopt unanimously and direct Clerk to forward copy and accompany same with letter. December 13, 1909.

Same date, Common Council concur unanimously.

Approved December 16, 1909, M. Liebel, Jr., Mayor."

The resolutions, after being signed by the Mayor, were forwarded by the City Executive to Captain Driscoll accompanied by a letter, of which the following is a copy:

"Jeremiah A. Driscoll, Captain tug Commodore Perry of the Pennsylvania State Fisheries Commission.

Dear Sir: In enclosing you a copy of a resolution passed unanimously by the councilmanic bodies of the city of Erie, and which I had the pleasure of approving, I take occasion to congratulate you upon the many hardships you suffered, the risks you ran, the grand heroism you displayed and the enduring fame you have won by your noble, self-sacrificing efforts to save human life and property on tempest-tossed lake Erie during the season of 1909.

Great praise and the econiums of a generous people are most justly due James Dailey and Lawrence Scully, your efficient and faithful crew, for so willingly braving every danger for so valiantly aiding you

Digitized by Google

in the good work of finding and rescuing hapless victims of the stormy, treacherous waters.

I am proud to be able to subscribe myself one of your friends and admirers.

Very truly yours,

(Signed) M. LIEBEL, JR.,
Mayor."

Erie, Pa., December 24, 1909.

The above resolution and letter are included in this report because I feel that the words accorded therein are merited and deserve the widest publicity.

FISH EXHIBIT.

The Agricultural Society of Crawford county, which holds its annual fair at Conneaut Lake, decided in 1908 to add to its attractions an exhibit of live fish. The management furnished tanks and a building and the Department furnished fish from the Crawford, Corry, Union City and Erie hatcheries. Although the tanks were very small and the number of fish limited the exhibit attracted very great attention from the visitors. The building was crowded nearly all the time. The exhibit was so successful in fact that the management this year built larger tanks better adapted for show purposes and a greater number. The Department very heartily co-operated and furnished the necessary fish. There were small mouth bass, rock bass, catfish, calico bass, rainbow trout, brown trout, brook trout, two species of sunfish, yellow perch, two species of carp, goldfish and several species of catfish, gar and muscalonge. The exhibit was the feature of the fair. The building in which the tanks were situated were crowded to such an extent that frequently guards had to keep the people in line so they could all see the fish.

Exhibitions of this character are very valuable educationally and should be a feature of every agricultural fair. It illustrates the importance of the larger cities each establishing an aquarium similar to the one in New York City.

THE DROUGHT.

The water situation is so grave that it may well excite alarm throughout the State. Last year the western half of Pennsylvania, the northern and northeastern counties and some of those in the east central part of the State were visited by a drought, the like of which had not been known in the memory of man and for which there was no record. Large streams dried and ordinarily unfailing wells lost their supply and many springs utterly failed. This year the drought was transferred from the western to the eastern part of the Commonwealth, and in the latter part of the year included the northeastern counties that had suffered in 1908. Last September Chief Bliss, of Philadelphia Weather Bureau, issued the following statement:

Digitized by Google

"In the Delaware basin and all of the Susquehanna basin except a few southwestern counties and a few localities along the northern border, the observers nearly all agree that July and August of this year have been the driest within their memory. Wells and springs are going dry and many people are compelled to haul water long distances. The ground in some places is dry to a depth of four feet and more and the leaves of the trees are drying and falling prematurely. The soil in some places has dried loose and dusty, while in others it is so hard that plowing is impossible.

"In most places east of the Susquehanna river the water supply for stock and household uses is already as low as it was at any time last fall. Berks county appears to be the centre of the drought stricken district and conditions seem to improve slowly in all directions therefrom.

"It is not the policy of the chief of bureau to furnish crop statistics of any kind, but it is an inevitable conclusion from the above statements that vegetation of all kinds is in a deplorable condition and late pasturage is very short and inferior.

"In response to a request for a detailed description of the drought many of the observers in the Ohio basin and in the southwestern portion of the Susquehanna basin wrote as if they wondered what drought was meant and several of them stated that some damage was noted during June and July, but conditions are now fairly good.

"The manager of the Western Water Company at Greensburg writes that because surface conditions are favorable few people realize the effect of the drought on the water supply. He states that the shortage of last year is now becoming noticeable in the deep wells, many of which furnished plenty of water throughout 1908 and are now going dry.

"This condition applies to the very deep wells only. The same thing is noticeable in many of the streams that are fed chiefly by springs which are running low or are entirely dried up. The river and larger branches are also low owing to the condition of so many spring-fed streams, but the larger streams have considerably more water at this time than last year.

"The situation which became so serious and caused so much suffering in the western part of the State last year, is being duplicated to an alarming extent in the eastern half of the State this year. The situation is worse this year than it was last year. In 1908 the deficiency in August's rainfall in the eastern half of the State did not show its effect until the end of the month, and, therefore, did not injure vegetation. This year the reverse is true. The rainfall for August of this year was about one inch below normal in the Ohio basin. The showers were timely and well distributed and, except in a few localities, the conditions were favorable.

"In the Susquehanna basin the shortage for August averaged more than two inches, making 4.50 inches deficiency since July 1st.

"In the Delaware basin the August rainfall was less than one-third the normal amount and very unevenly distributed. As a result a few localities received moderately heavy rains while in the greater portion of the basin the situation is becoming alarming. The average deficiency for the month was about 3.25 inches, making a total shortage since July 1st of nearly six inches or about 65 per cent."

Digitized by Google

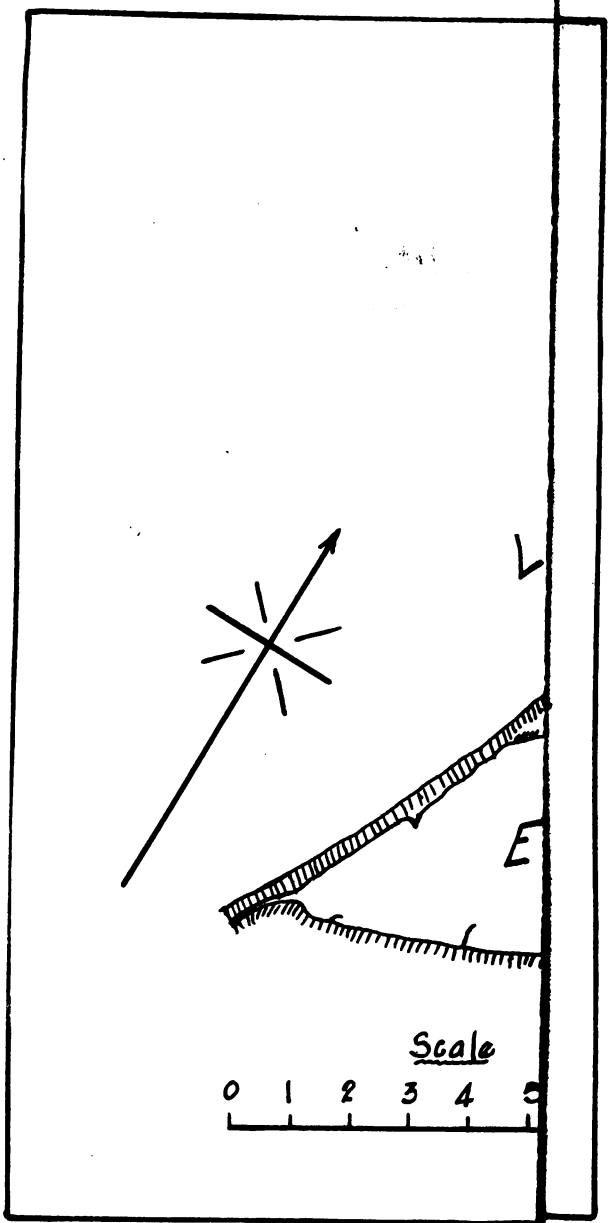
The conditions Mr. Bliss set forth in his statement early in September remained with very little change to the end of the year. It is true that there was a fairly heavy and general rainfall throughout the State the second week in October, but the ground was so badly parched, deforestation so general that it is doubtful whether the rainfall was of any lasting good.

Even if rainfall should be abundant or snow should be heavy during the winter and the meteorological conditions normal the effect of the drought of 1908 and 1909 must be felt in the deep springs and spring streams for three or four years to come. The effect on the deep springs and spring streams was more noticeable this year in the western part of the State than while the drought was prevalent. The two years in the northern and northeastern counties is already exhibited and some of the springs which still furnished water this year are likely to be dry next year.

Such a state of affairs must prove a setback to the fish cultural work of the State. Every spring and every stream on the State hatcheries have been greatly affected. Last year a small stream at the Conneaut Lake Hatchery dried up and remained dry until early this autumn, excepting for a brief period in the spring. One spring at the Corry Hatchery yielded only a dribble of water, another remained unaffected and a third was slightly reduced. The stream supplying the ponds at the Union City Hatchery at one time fell almost to danger point and the creek flowing through the Wayne Hatchery was reduced to about one-half in volume. The spring at the Spruce Creek Hatchery, the two springs and the creek at the Bellefonte Hatchery and the small spring run at the Torresdale Hatchery did not appear to have their flow diminished in the slightest degree. The large creek flowing through the Crawford Hatchery did not appear to be affected. This year that stream was reduced in size one-half. The spring at the Spruce Creek Hatchery fell from 2,000 to 1,500 gallons a minute and the supply at Spruce Creek was greatly lessened, but the spring run was more than sufficient for the needs of the hatchery. The springs at Bellefonte and Logan Branch were each reduced about one-half. The spring at the Wayne Hatchery dwindled from 400 gallons of water a minute to 10. The normal supply of water in the Lackawaxen creek, which flows through the grounds, would fill a 16-inch pipe in the summer months, but on the 1st of October a four-inch pipe would have been more than sufficient to carry off all that flowed through the creek at one time. As a consequence, disaster overtook the hatchery. To save the yellow perch and other warm water fish the supply from all the ponds, except the bass ponds, was cut off and the fish transferred there in one family with probable death to some of the smaller specimens through cannibalism. Even with this reduction in the number of ponds there was not sufficient water from the spring and the creek to supply the trout ponds and keep the old fish healthy. The temperature ran up and hundreds of two-year-old and three-year-old trout contracted fungus and died. Not more than 500 fish survived and these were so weak that the eggs were worthless. Fortunately, the yearlings were able to survive so that the trout stock at this hatchery of the two-year-old or brood fish will be fair next year, providing a further supply of water can be secured. To accomplish this it is my purpose to drive a deep or artesian well on the Wayne Hatchery grounds. Owing to the drought in the northeastern part of Penn-

Digitized by Google

Google



Digitized by Google

sylvania, especially in the Wyoming Valley and Wayne and Lackawanna counties, individuals, water companies and manufacturers have been obliged to resort to this method of replenishing their water supply.

I am looking for a still further reduction in the water supply from the springs at the hatcheries next year and can only hope that I will be mistaken. We could stand a further loss at the Spruce Creek Hatchery and perhaps at Corry, but we couldn't stand a loss at Bellefonte, which is the largest trout station in the United States, requiring 400 gallons for the hatching houses and over 3,000 gallons for the ponds. It is doubtful whether at present the total supply is over 5,000 gallons.

In the localities where the drought prevailed with greatest severity in 1908 the three-year-old and two-year-old trout suffered severely, especially the former. The yearling trout and the fingerling trout suffered very little. The result was that this spring the streams contained an abundance of two and one-year-old fish, or fish from five to seven inches in length, and a few three-year-old or fish from seven to nine inches in length, and very few trout of larger size. In the sections where the drought was confined this year probably most of the old fish that survived last year were killed.

PROPOSED FISH HATCHERY AT PRESQUE ISLE.

A year ago a movement was started by certain prominent citizens of the city of Erie to have a portion of Presque Isle Peninsula turned over to the Department of Fisheries as a fish cultural station. The movement met with my approval and it was fostered by the Chamber of Commerce and the Board of Trade of Erie. Strong resolutions endorsing the project were introduced into the Board of Trade and a committee appointed to report on the matter.

On the invitation of the committee and the Board of Trade itself, I visited Erie and made an address before that body and a number of other prominent citizens, outlining the possibility of the property for fish cultural purposes. The resolutions introduced at the previous meeting were unanimously adopted and the committee directed to prepare a bill to be approved by the Commissioner of Fisheries and have it introduced at the next session of the Legislature. The following bill was then drawn and on its approval by me was introduced into the House by Representative Shreve and in the Senate by Senator Sisson.

An Act

Providing for the Department of Fisheries of the Commonwealth of Pennsylvania entering upon and occupying, with the approval of the United States, certain lands on the peninsula known as Presque Isle, in Erie county, Pennsylvania, and improving the same and the ponds thereon, and establishing a hatchery thereon for the propagation of game and food fishes; to erect buildings and structures thereon suitable for that purpose, and to make walks and roads on said lands, for ingress to and over said premises, and for the proper care and maintenance of the same.

Digitized by Google

Whereas, there are, on the peninsula belonging to the Commonwealth of Pennsylvania, and known as Presque Isle, in the county of Erie, Pennsylvania, a large number of ponds suitable for the hatching and propagation of game and food fishes, such as bass, pike and muscallonge, some of which cannot be readily hatched by artificial means, and which ponds were the natural habitat and hatching grounds of said fishes prior to the closeure of the connections between said ponds and the waters of the Bay of Presque Isle;

And whereas, by improving said peninsula and cleaning and improving said ponds and stocking them with breeding fish, the Department of Fisheries can utilize these natural breeding grounds to very largely increase the production of game and food fishes;

Section 1. Be it enacted, etc., That the Department of Fisheries of the Commonwealth of Pennsylvania is hereby empowered and directed to enter upon and occupy all that part of the peninsula known as Presque Isle, in the county of Erie, Pennsylvania, lying and being betwen the east line of the Erie Water Works lands and a line substantially parallel with and adjacent to the west side of the present walk extending from Misery Bay to Presque Isle Lighthouse, on the north shore of said peninsula, and improve the said lands and the ponds thereon; and establish thereon a fish hatchery for the propagation of game and food fishes, erect suitable buildings and structures on said lands therefor, and make suitable walks, roads, docks and approaches thereto and thereon, as may be deemed necessary to establish said hatchery; and care for the ponds and the lands hereby appropriated, and other facilities established and maintained on said peninsula, for the propagation of game and food fishes; Provided, however, that all the rights hereby conferred upon the Department of Fisheries of the Commonwealth of Pennsylvania shall be and are subject to the grant heretofore made to the United States by the Commonwealth of Pennsylvania.

Approved—The 22nd day of April, A. D. 1909.

The bill passed both Houses unanimously.

To the Honorable Arthur L. Bates, member of Congress from the Twenty-fifth District, was intrusted the preparation of the necessary final enabling bill to be introduced into Congress, and the following is the text:

A Bill

Granting certain rights and privileges to the Department of Fisheries of the State of Pennsylvania.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Department of Fisheries of the State of Pennsylvania is hereby granted the right to enter upon and occupy the following described land of the United States known as "Presque Isle Peninsula," in the county of Erie and State of Pennsylvania, to wit, all that part of said Peninsula lying and between the east line of the Erie waterworks lands and a line substantially parallel with and adjacent to the west line of the lands of the Presque Isle lighthouse, on the north shore of said peninsula, and the line of the present walk leading from said lighthouse to the north shore of Misery Bay, for the purpose of establishing and maintaining thereon a hatchery for the propagation of game and food fishes, and in pursuance thereof to improve the lands and ponds and

Digitized by Google

reclaim marsh lands thereon; to construct buildings, houses and sheds and docks and approaches from Presque Isle Bay to said lands and to the ponds and hatchery buildings on said lands; to lay out, build, and maintain roads and walks in connection therewith, and plant trees and shrubs thereon for the preservation thereof: Provided, That the occupation and use of the said lands for the aforesaid purposes shall in no manner affect the right, title, and interest of the United States in and to said lands, nor the government right of passage over and across the lands so occupied; and the said Department of Fisheries of the State of Pennsylvania shall do nothing on said lands that may injuriously affect the harbor of Erie or the peninsula of Presque Isle as a protection for the harbor: Provided, further, That the United States shall not be liable for any damages whatsoever that may at any time occur to the improvements of the Department of Fisheries on said lands; and provided further, that the exercise of the rights hereby granted and the execution of any work on said lands hereby authorized shall be in accordance with such plans and specifications as may be approved by the Secretary of War and subject to such further stipulations and conditions as he may prescribe.

Section 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Presque Isle Peninsula, many years ago an island, but transformed into a peninsula by filling in the narrow space between the southern end and the main shore, is about seven miles long. The southern half is very narrow, but the northeastern half widens in places to nearly a mile and a half. Starting at the western side of the city of Erie it curves northeastwardly to a short distance beyond Mill Creek on the east side of the city of Erie, and then bends sharply southeastwardly to within about half a mile to the main shore and thus forms the outer boundary of the magnificent harbor of Erie.

The greater part of the peninsula is low, rising only a few feet above the level of the lake, but over it are scattered a number of ridges from ten to twenty feet high. About midway down the peninsula are six ponds, and these, together with a large tract of surrounding land, have been turned over to the city of Erie to permit the ponds, which are known as the Chimney ponds, to be used by the city as reservoirs.

On the wide or northeastern head of the peninsula there are about a dozen and a half ponds of varying size, the longest of which, named Long pond, is nearly a half mile long. Other prominent ponds in that section are known as Cranberry, Big pond, Graveyard pond, Ridge pond, Yellow pond, Bass pond and Niagara pond. All of these, with the exception of Ridge, Yellow, Bass, Niagara and about a half dozen smaller ponds, it is designed to be embraced in the tract it is proposed to turn over to the Department of Fisheries.

Until a few years ago the peninsula was the property of Pennsylvania. It was then transferred to the United States Government for certain purposes. The National Government only used a small portion from the centre of what is called Misery Bay to the end of the peninsula. Here a lighthouse was built and a lifesaving station established. The section now used by the city of Erie was turned over to that municipality by the Legislature with the approval of Congress. The tract, it is intended for the use of the Department of Fisheries, if Congress concurs, begins at the northeastern line of the part controlled by the city of Erie to the boardwalk which extends from

Digitized by Google

Misery Bay to the lighthouse. The tract contains, it is said, between eight hundred and one thousand acres. At present the entire peninsula, with the exception of that occupied by the city of Erie and the grounds around the lifesaving station and the lighthouse, is a primeval wilderness covered with huge trees and underbrush, so thick that in places it is almost impenetrable; poison ivy is rampant, mosquitoes in the summer make the place almost unbearable. Swampy places abound and each of the ponds are surrounded by marshes. The ponds themselves are shallow, the deepest not being more than four feet.

A cursory view of the property would give the impression that it would be a hopeless task to transform this spot into a useful and inhabitable place, but a closer view indicates the possibility of making it a garden spot and of inestimable value for fish cultural work and at a comparatively low cost. It is doubtful if more than $300,000 would be necessary to transform the present unsightly wilderness into a beautiful park and the ponds into superb nurseries for breeding fish and on a scale now not dreamed of in any existing hatching station.

It would probably also solve two or three at present difficult fish cultural problems, among them the successful propagation of the fresh water sturgeon, now apparently on the verge of extinction in Lake Erie. One of the ponds could be utilized as vast breeding grounds for muscallonge and render possible the complete restoration of that magnificent food and game fish in the lake and some few of the larger and deeper lakes of the State. It would permit the propagation of black bass on a scale even larger than the State now propagates brook trout; that is to say, by the millions. Yellow perch, now being slowly restored in the lake, could be increased with great rapidity by means of another pond. After the property has been put in shape the cost of maintaining it would not be more than the maintenance of two or three of the present hatcheries, possibly less.

It may be said that no movement in fish cultural work has been as important as this since the work of fish culture was first started in Pennsylvania and the establishment of the Department in 1903.

I have said that it would probably take about $300,000 to put this proposed plant into shape for operation. By this I do not mean that it would be necessary to appropriate such a sum by a single Legislature. Indeed it could not be used. About $30,000 would be all that could be profitably employed between sessions.

BLACK BASS SEASON.

The black bass season opened auspiciously and it remained phenomenally good until the prolonged drought lowered the streams to such a point that the fish were compelled to seek refuge in the deeper pools, where they refused to take bait. From this period, which was about the first of September until the end of the year, there was little or no fishing even in such places as the North Branch of the Susquehanna. The West Branch of the Susquehanna lowered more rapidly than the North Branch and by the middle of July the fishing there was at an end.

Digitized by Google

The Perkiomen creek remained a good fishing stream, perhaps longer than any other water in the State. From the opening of the season, June 15th, until the first of August, the angling for black bass in the Perkiomen was far finer than for many previous years. There was, however, one gleam of satisfaction to be taken from the drought and the stopping of the fishing, namely, that the low clear water exhibited vast quantities of bass of all sizes, particularly young fish, indicating splendid sport when once more the waters should become normal. Even the lakes were affected by the drought, which naturally affected the fishing.

It is customary for the lakes to "work" once every year; that is to say, throw to the surface fine particles of water vegetable life. Usually this is during what may be called the low period, but on account of the abnormally low water in the lakes many of them worked twice and three times. Some were undergoing this prenomena as late as October. This was notably the case with Carey Lake in Wyoming county. This also caused poor fishing, for it is seldom that bass or any game fish will bite freely when a lake is working.

SILVER SIDE SALMON.

The effort to rear silver side salmon to maturity in hatchery ponds continues to progress very favorably and I find no reason to modify what I said last year with respect to the possibilities of the fish. Those which we had last year remain this year in normal health and made good growth. The death rate, if anything, is below that of the brook trout. Their vitality is little short of remarkable. Thus far they have shown less liability to disease in their confined environments than either brook trout or the brown trout.

We have 5,000 yearlings at the Spruce Creek hatchery and at that establishment there is a rather high percentage of enlargement of the thyroid gland among the brook trout and brown trout and a little among the lake trout, but of many specimens of silver salmon examined there was not a single trace of this disease visible. In fact, everything thus far indicates the fish known to be exceedingly valuable for food may be established successfully in our waters.

The crucial test of the ability to carry the silver side salmon to maturity in the hatchery ponds should be this year for the fish which are now two years old. My reason for this feeling is that in their natural surroundings young salmon are apt to remain in fresh water until they are nearly or not quite two years old. If, therefore, the two-year-old silver salmon now in the Bellefonte hatchery feed as voraciously during 1910, as they have hitherto done, and remain otherwise normal, there is a seasonable certainty that they can be brought to the spawning age. Having been brought to that point it must then be determined whether or not a changed environment will bring about, as sometimes is the case, infertile eggs or barren fish.

Digitized by Google

STURGEON CULTURE.

One of the baffling features of fish culture has been the propagation of the sturgeon. That it has proven so is especially unfortunate owing to the rapid decrease in the number of this very valuable food fish in all the waters of the United States. With each succeeding year the catch has been nearly cut in half until it is scarcely profitable to fish, especially for them.

Sturgeon fishing in the Susquehanna is entirely exterminated and it is scarcely on a paying basis in the Delaware. At the outset, a few years ago, there was some little difficulty found in hatching sturgeon eggs, but the late Professor Rider and the late Livingston Stone each finally succeeded in some sort of results, the first named with river sturgeon and the last with lake sturgeon.

The chief problem which confronts the fish culturist to-day is not so much the hatching of the eggs as the securing of ripe males and females at the same time so that the eggs may be fertilized. It was not uncommon to capture a ripe female and not find a ripe male for a week, or vice versa. Every effort to pen large common sturgeon until the eggs and milt ripened ended in complete failure. In 1908 our men noticed that the short-nosed sturgeon reached a spawning age at a very much earlier period and when of a much smaller size than usually supposed. Careful watching convinced us that medium size common sturgeon would also produce eggs.

A number of short-nosed sturgeon were, therefore, captured and placed in one of the larger ponds on the Torresdale hatchery. They were about equally divided as to sex. The majority produced either ripe eggs or milt, but neither ripened at the same time. The changing of the fish from a larger and shallower pond resulted in the death of all of them in the winter. Last spring we secured a large pond of small short-nosed sturgeon ranging from a foot and a half to three feet in length. There were about five males to one female. This proportion was deliberately set by the Superintendent. Two females ripened at the same time as four males and the eggs were taken. The first female the eggs were not all ripe and, owing to inexperience on the part of the Superintendent very few of the eggs hatched. He treated the second lot differently and a good proportion were incubated.

The result of the work conducted at Torresdale in 1909 indicates that a mistake is made in attempting to hatch them by the jar method. They are so heavy and glutinous that in the first place the jars had to be set one at every other trough in order that a sufficient force of water could be secured to move the eggs, and, secondly, on account of their heaviness those which fungused would not rise to the top of the jar, making screening almost impossible. It was evident to the Superintendent that much better results could be obtained if the eggs were hatched on trays, using the same mesh as for lake trout.

The indications are also that short-nosed sturgeon can be successfully reared to egg-bearing period in hatchery ponds provided the ponds are at least 200 feet long and 75 feet wide and from three to six feet deep. There is reason to believe that in water of this area a lim-

Digitized by Google

ited number of common sturgeon, the more important of the two species, could be reared to maturity. It is also certain that to have any measure of success there must be a very large proportion of males to females.

The death of the sturgeon when transferred last winter indicates pretty plainly that there must be a good depth of water and that shallow ponds even though below the ice line are not favorable for their existence.

A start was made with the lake sturgeon. All undersize lake sturgeon found in the nets in Lake Erie last spring were taken possession of and shipped to either the Erie Auxiliary or Crawford hatchery, but it is doubtful if enough were so secured to warrant any hope that fertilized eggs will be had next spring.

FRESH WATER TERRAPIN.

A year or two ago the attention of the Department was called to the advisability of experimenting in the culture of fresh water terrapin. Investigation showed that there was a steady and marked decrease in this delicate food product, so much so that at times both the red-legged and green-head terrapin commanded fancy prices in the market. It was determined to undertake the experiment of propagating them.

A pond that had been used for the rearing of frogs at Torresdale was set apart for the initial work. As practically nothing is known of the work the Superintendent and I had to grope towards success. As a beginning sand was placed around the banks of the pond as a place for the terrapin to lay their eggs, under the supposition that they deposited their eggs in the sand the same as the salt water terrapin, but the experiment was a failure. The terrapin refused to utilize the beds and did not deposit any eggs as far as we were aware. Last spring the location was changed and another pond and a fence built around it at a distance of ten or fifteen feet. The natural shore was allowed to remain as was also the grass. Four dozen terrapin were introduced, a few more females than males. The terrapin took to their new quarters and apparently found themselves in environments to their liking. Early in July they mated and deposited their eggs. Most of the eggs hatched in a few weeks. The young turtles, as soon as they emerged from the shells, made their way to the water and disappeared and have rarely been seen since. The results show that the Superintendent is moving in the right direction and within two or three years other ponds will be built in all the hatcheries and terrapin distributed as are fish.

There is one establishment in the State where the rearing of the red-legged and green-head terrapin has been carried on for several years with success. The work, however, has been done for the benefit of the table of the owner, the late Robert N. Corson, White Marsh township, Montgomery county, near Chestnut Hill. The work was performed by Frank Smith, Mr. Corson's head gardener, and in two years after beginning the work he had over two hundred fine healthy specimens. The work was done in an ordinary concrete cistern which

Digitized by Google

supplied water for the greenhouses, but, encouraged by the results, a pond was constructed near the banks of the Wissahickon creek, and enough terrapin had been raised to keep the table of the owner well supplied.

This work, carried on a small scale though it was, is an encouragement for others to attempt the work on a larger scale.

ABANDONMENT OF GOLDFISH WORK.

When the Department was created I undertook the propagation of goldfish specifically for aquaria in public schools, public institutions and for public fountains and parks. I believed, and still believe, that these fish so distributed would prove of educational value. Unfortunately, however, certain other features have arisen which seem to me to overshadow this idea of mine, which renders it desirable that gold fish culture be abandoned.

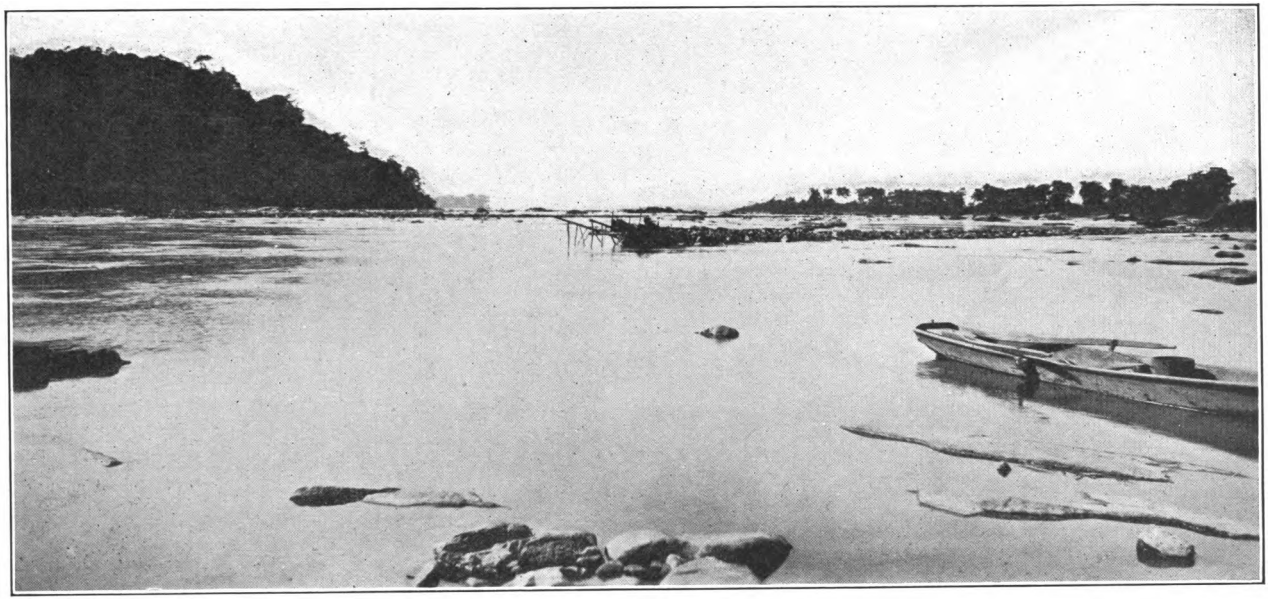
One consideration which has led me to this determination is that a very large number of people seem to think that because the goldfish were raised by the State in some of the hatcheries, they should have them to supply aquaria in their own homes, and not only that, they should receive them without cost, but that the State should deliver them free to their doors.

Naturally, I cannot subscribe to this sentiment nor do I believe it is in consonance with the spirit of the fish laws. Under provisions of the Acts, both of 1901 and 1909, game or food fish propagated by the State should only be planted in waters where the public are allowed to fish. Technically the goldfish is a food fish under the Act of 1909, and, while fish may be placed in private ponds for exhibition purposes, it does not seem just that the State should destroy the business of those engaged in rearing and having goldfish for sale should have their business injured by the State giving them away to private parties. The most important consideration, however, which has led me to discontinue the rearing of goldfish is that the ponds which they require can be utilized to greater advantage for the propagation of other warm water fishes.

FISH BASKETS.

I regret to say that the new fish basket law is not operating satisfactorily. The device has always been considered by those who watch the protection of fish closely as a very destructive device, to such an extent that it was prohibited by law in the latter part of the eighteenth century in Pennsylvania waters, and it remained an illegal device until 1903. Before that time Legislature after Legislature almost uniformly refused to approve the fish basket. In 1903 those who advocated fish baskets presented a bill containing certain restrictive provisions and with substantial license fees. While the device was considered destructive it was also recognized that it was the best adapted for catching eels. It was evident that the eel industry, if encouraged,

Digitized by Google



Fish Basket on the Susquehanna.

Digitized by Google

Digitized by Google

could be made profitable especially in the Susquehanna river. The bill proposed by the fish basket men was adopted, the Department withdrawing objection on account of the apparent disposition of those who wished to operate it not to take anything save eels and to strictly observe the provisions of their proposed bill. The act was passed and I must say that a majority who took out their licenses endeavored to carry out the provisions and operated the device satisfactorily. Nevertheless it was evident that the law operated against the interests of the fishermen was not perfectly protective and was also obscure in some provisions. The fish basket men proposed another bill, which was accepted by the Department subsequently with some changes, but not all the Department desired and thought should be made.

Among the weak features was the reduction of the license fee from $6 to $1. This reduction was very unfortunate since it opened the doors to very many men who cared for nothing excepting to catch fish regardless whether they were eels or catfish. The number of baskets licensed multiplied three times and the revenue fell off one-half.

At the last session of the Legislature there was very strong objection developed to the basket in all parts of the State. Its destructiveness was pointed out, the flagrant disregard of the provisions of the act as well, and strong protestations were made against the device. The Department felt, however, that the fish basket should be given another chance and a new set of provisions were drafted. The original license fee of $6 was re-inserted, but stricken out and $1 allowed to remain. Baskets, however, were excluded from streams known to contain trout. The new law went into effect on the 15th of August and it became apparent almost at once that the majority of those who took out licenses had no intention whatever of obeying the law. More than 80 per cent. disregarded one or more provisions, and many more attempted, despite the law, to secure and operate fish baskets in streams known to contain trout. In one stream, out of twenty licensed baskets it was necessary to proceed legally against eighteen, and in all it was necessary to prosecute nearly two hundred licensees. If the Department had prosecuted for every violation the number would have reached over five hundred. The majority of the baskets were improperly constructed in at least two particulars in every instance, and in some there was not a single provision obeyed. Slats in the falls were fastened, license numbers not put on, fished day and night, Sunday included, game fish kept and open defiance expressed. In one instance a man secured a license for a location in a stream known to contain trout, representing to the County Treasurer that the stream did not have that fish in it. The County Treasurer, on notice from the Department, returned the money and cancelled the license. The man refused to give up the license, operating the basket with open effrontery, and, when arrested, fought the case bitterly. Under the circumstances, it is evident that the mass of people who operate fish baskets are not fit to be trusted with the device. The Department feels that either the law recognizing fish baskets should be repealed entirely or a license of such an amount imposed that none except those who are lawabiding citizens will use the device. Under existing circumstances I am inclind to believe that the former course is the best and the fish basket entirely eliminated as a legal device for catching fish.

Digitized by Google

FISHWAYS AND SCREENS.

Only three fishways were constructed during the year, two by the State under specific appropriation made for such work, and one by the owners of the dam. One fishway constructed by the State at a cost of $3,750, was built in a dam on the Shenango river at Greenville, Mercer county. A second was built by the State in a dam at Lanesboro at a cost of $1,500. A third was built in a dam at Susquehanna, Susquehanna county, by the Susquehanna Light and Power Company. All are what is known as the Cail pattern. There now remains only one dam in the North Branch of the Susquehanna river in Pennsylvania without a fishway. This dam is at Nanticoke. When a fishway is constructed in this dam and fishways in two dams on the West Branch of the Susquehanna every such structure in the Susquehanna and its tributaries will have passageways for fish. In the Shenango there are two dams without fishways and one will probably be placed in the first dam below Greenville in 1910. This will probably exhaust the appropriation. Fishways are being constructed in the dam on the Raystown branch by the corporation owning it.

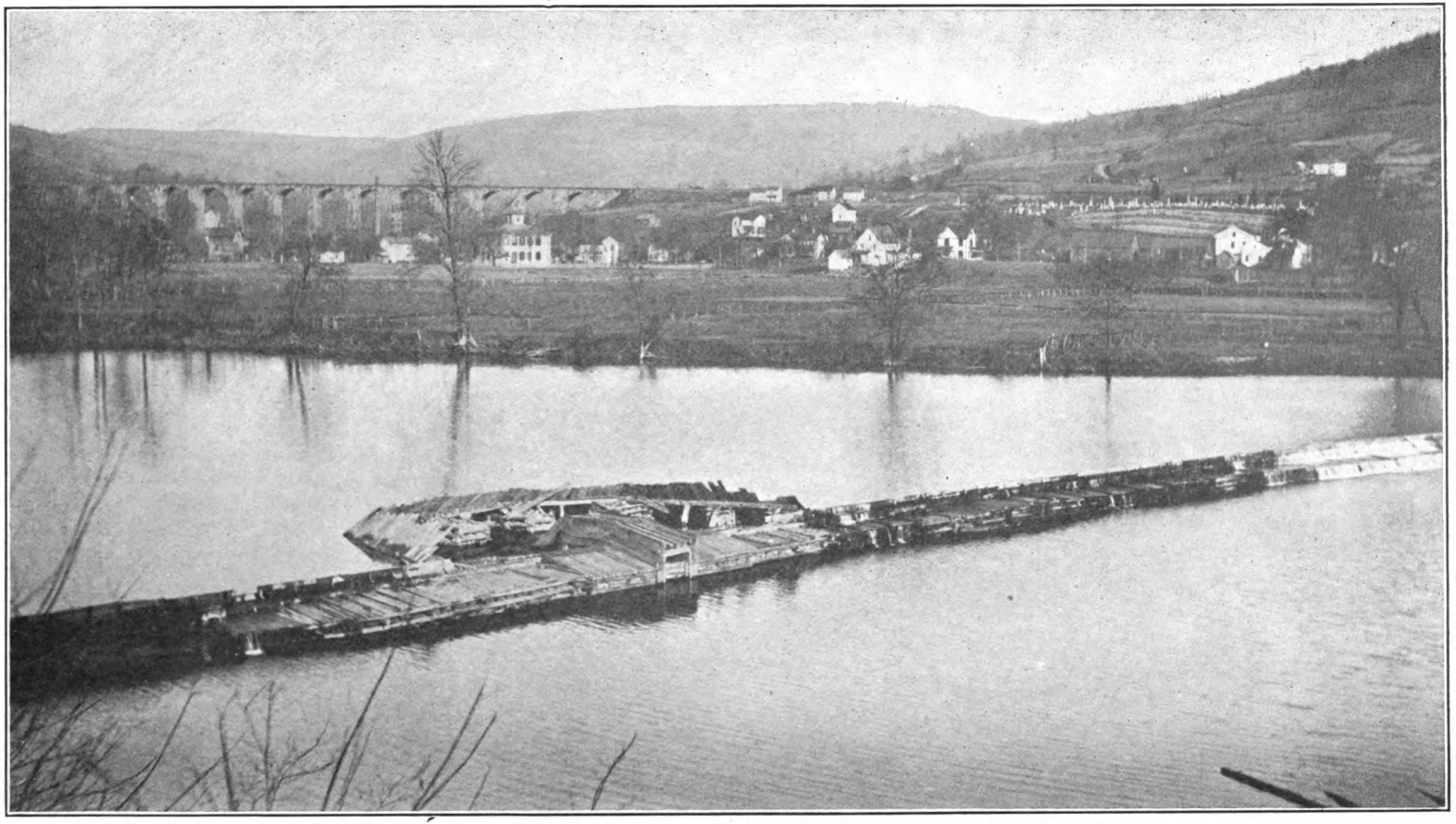
Owing to the prolonged drought and the consequent exceeding low water, nearly every dam owner took advantage of the provision of the new law and closed the fishways for 30 days, and in three instances, on represenation of the owners, permission was given by the Department to keep the fishways closed for the remainder of the year. No harm was done by such permission since the waters were so low that few fish would probably have moved up or down while the owners at least believed that such closing was beneficial and necessary for the maintenance of their establishment and this seemed to me to be of paramount importance.

AMERICAN FISHERIES SOCIETY.

The American Fisheries Society, an organization composed almost entirely of persons either directly engaged in fish culture or deeply interested in it, and of Fish Commissioners in the United States, met this year in Toledo, Ohio. The meetings invariably are so pregnant with material which make towards advance in fish culture that I usually require the Superintendents of the hatcheries to be present and take part. This year, however, on account of the fact that the summer meeting of the Superintendents took place only a short time before the date of the Toledo meeting, and on account of an unusual amount of work on the various hatcheries, the requirement this year was suspended and only two were present. Subsequently, despite the inconvenience which would have resulted, I regretted my suspension of the rule, and Superintendents themselves regretted their absence.

The meeting was one of unusual value to fish culturists as much of the time was devoted to practical pond culture, particularly with respect to what are called the commoner types of fishes—a form of fish cu'tural work which has by no means reached perfection in all its

Digitized by Google



Fishway in Lanesboro Dam, North Branch, Susquehanna River, Showing Crib Still in Place.

Digitized by Google

Digitized by Google

branches. From the discussions, however, it is a gratification to be able to say that the Superintendents of the Pennsylvania hatcheries are at least as far advanced in the science of pond culture as those of any other Government.

The American Fisheries Society again pronounced strongly in favor of Federal control of waters forming the boundary lines between States and supported the action of the National Government in assuming charge in connection with the British Government of the waters that form the boundary line between the United States and the British possessions in North America.

Before adjoining the American Fisheries Society honored me by electing me vice president to serve at its next annual meeting in New York City in 1910.

NORTH AMERICAN FISH AND GAME PROTECTIVE ASSOCIATION.

Another important organization of an international character is the North American Fish and Game Protective Association. For eight years it has yielded a great influence in Canada and northeastern United States, especially in fish and game protection. At its meeting in Toronto in January, 1909, it conferred upon me the honor of choosing me as its president, to succeed the Honorable Dr. J. O. Reaume, Minister of Public Works and Fisheries, of Ontario, and it was decided to hold its next annual meeting in Philadelphia January, 1910. The Philadelphia meeting, it is hoped, will bring to it the strongest advocates of fish protection in the State and arouse even a greater sentiment in favor of fish and game protection.

STATE ORGANIZATIONS.

With every recurring year I have advocated and urged the extensions of organizations in Pennsylvania interested in the protection and increase of fish. I have also urged and advocated the banding together of all local organizations into State bodies. It is, therefore, a matter of pleasure to be able to note the fact that nearly fifty clubs having fish protection as a prominent object, have been organized in the State within the last year, and that a large proportion have followed my counsel and joined with one or the other or both of the two principal State organizations, namely, the State Sportsmen's Association and the United Sportsmen of Pennsylvania.

The first named now has enrolled more than a hundred clubs pledged to the protection of game, fish and forests, while the second, the United Sportsmen of Pennsylvania, has nearly forty camps devoted to the protection of fish, forests and game, and the raising of the standard of sportsmanship in the State.

Digitized by Google

The two great organizations combined their clubs or camps in nearly every county in the State, and may be considered together as a compact body of sportsmen, numbering close, it is said, upon fifty thousand. Furthermore, it is a matter of pleasure to note the very close and harmonious relations which exist between these two great bodies. With all the sportsmen in the State so banded there will be more fish, higher ideals of sport and more perfect fish protective laws.

There is another organization holding a State charter which should be mentioned on account of the effective work it has performed in the interests of fish and the unswerving support it has given the Department, to wit, the Pennsylvania Fish Protective Association. It took as active a part as either the State Sportsmen's Association or the United Sportsmen in working for the passage of the new fish code, and it has performed splendid service in educating people to the necessity of protecting fish and also in stocking streams.

LOCAL ORGANIZATIONS.

Most of the local organizations have been very active. Among them should be prominently mentioned the Chester County Fish and Game Protective Association, Steelton Camp of the United Sportsmen, Phoenixville Camp of the United Sportsmen, East Greenville Camp of the United Sportsmen, Pottstown Camp of the United Sportsmen, and the State Sportsmen's Association and the Lancaster County Fish Protective Association.

Through the activity of the first two named it proved unnecessary for the wardens of the Department of Fisheries to make a single arrest during the year 1909 in the districts in which those two organizations exist. The others, not quite so long organized, caused a marked reduction in illegal fishing. All have been exceedingly active in the intelligent stocking of the streams in their respective territories, and the Chester County organization has interested the farmers of the county to such an extent that many are now planting trees along streams which flow through their lands to secure a more equitable water supply with temperatures better suited for the life and health of fish.

These organizations have been specially mentioned, not because they have all done more work than other organizations, but because in one or more particulars they have taken the initiative.

INTERSTATE LEGISLATION.

The conflicting legislation between the different states that border on the Delaware and Susquehanna rivers has been a source of annoyance for a number of years. Efforts have been made several times to bring about a change and secure uniform legislation in the Commonwealth of Pennsylvania and the states of New York, New Jersey and Maryland, so that good results may be obtained in restoring the supply of fish in the two great rivers. Commissions have been appointed

Digitized by Google

on the parts of the states mentioned and various meetings have been held with more or less good result. The following is the report of the Pennsylvania Commission to the last Legislature showing what it accomplished and what it hoped to do in the future:

To the Honorable the Officers and Members of the Senate and House of Representatives of the Commonwealth of Pennsylvania:

Your Commission, appointed under a joint resolution, approved the eighth day of May, A. D. 1907, entitled, "A Joint Resolution providing for the creation of a Commission to co-operate with the authorities of the states of New Jersey, New York and Delaware in regard to the propagation, protection and catching of sturgeon, shad, bass, perch and other fish in the Delaware river; the adoption of concurrent laws relevant thereto by such states, and to co-operate with the authorities of the state of Maryland in regard to fish and fishing in the Susquehanna river, and the adoption of concurrent laws relevant thereto by such states; and to inquire in relation to the pollution of the waters of said rivers, and recommend legislation regulating and controlling the same; and making an appropriation for these purposes," respectfully submit the following report:

Through the efforts of your Commission a similar Commission was appointed by the Legislatures of the States of New Jersey and Maryland. Several meetings have been held with these various Commissions and fishery officials of New York. A uniform law was agreed upon between your Commission and the Maryland Commission regarding the taking of fish with nets and the transportation of fish from one state to another and also for the collection of eggs for hatching purposes by authorities of the two states. While these matters were thoroughly discussed and agreed upon and a proposed law drafted governing the subject, the Maryland Commission has, up to the present time, been unable to secure its enactment into law. These subjects are all contained, so far as your Commission is concerned, in the bill relating to the interior waters now pending before your honorable bodies.

Many joint meetings with the New Jersey Commission have been held at various places at which were discussed the propriety of securing the enactment of uniform laws to govern and control the propagation and the taking of fish from waters which constitute the boundary lines between the two states.

In order that the importance of this subject may be called to your attention, we desire to state that an agreement was entered into between Pennsylvania and New Jersey in 1783 concerning the mutual government of the river. This agreement was ratified by New Jersey May, 1783, and by Pennsylvania on September 20, 1783, by Acts of Assembly. For many years this agreement was strictly carried out between the authorities of both states and on May 22, 1889, the Pennsylvania Legislature passed an act entitled, "An act for the protection of shad, sturgeon and game fish in the Delaware river." A similar act was passed by the State of New Jersey April 7, 1890. It was not long after, however, before New Jersey passed several laws without consultation with Pennsylvania which entirely changed the then existing statutes governing that portion of the Delaware river under the jurisdiction of the State of New Jersey.

Digitized by Google

This, of course, caused constant conflict between the fishermen and the authorities of the two states. It is well known that the law has established the centre of the river as the boundary line between the two states. New Jersey fishermen constantly violate the Pennsylvania laws in fishing under New Jersey laws on the Pennsylvania side of the river and the Pennsylvania fishermen violate the New Jersey laws by operating their nets in the New Jersey portion of the stream, and both often unintentionally.

The result of this conflict of authority, together with the pollution of the Delaware river, has greatly impaired the fish supply until the condition has arisen whereby the fishermen in both states have joined with your Commission and that of New Jersey in recommending the passage of uniform legislation governing this particular stream. Your Commission admits that, in their judgment, unless these laws are passed and the pollution of the stream greatly reduced or entirely prevented, that the propagation of shad and the taking of the same from the Delaware river will become practically extinct as is to-day the case with the sturgeon.

As an outcome of the conference between the Commissions of the two states and the fishery authorities of New York, three bills were framed, one governing the fisheries of the Delaware river below Trenton Falls or in tidewater, between the Commonwealth of Pennsylvania and the State of New Jersey, a second for the Delaware river above Trenton Falls and beyond the limits of tidewater between the Commonwealth of Pennsylvania and the State of New Jersey, and a third for the Delaware river between the Commonwealth of Pennsylvania and the State of New York. The division of the subject into two bills between the Commonwealth of Pennsylvania and the State of New Jersey was because of radically different conditions existing above and below Trenton Falls rendering such action necessary. The bills drafted have been introduced by Representative Alfred Marvin and are appended as part of this report.

On the other hand, if these laws are passed and proper attention given to the purification of the water, there is no doubt that the shad and sturgeon industry of this stream can be fully restored by the work of the fishery authorities of the states. New York Commission have practically agreed to the conditions of the Pennsylvania bill and promise to use their influence in securing its passage by the Legislature.

Your Commission made a careful inspection of the Delaware river below Trenton Falls and found it was so badly polluted by drainage taken in from both sides as to be injurious to human health and fish life. The major portion of this pollution, we believe, can be abated. Rivers and all streams of water flowing in and through our Commonwealth are not the natural and proper outlet for filth and pollution of all kinds and the most stringent laws should be passed to maintain their purity and unobstructed course to the sea. Human health and the maintenance and increase of aquatic food life are a far greater consideration to the public than the financial interests of any individual or corporation. The importance, for example, and the propagation and the maintenance of the shad industry in the Delaware river cannot be measured by dollars and cents. "Conservation of the fishery resources of the country is as important as the protection of forests," said President Roosevelt recently, "and decided steps must be taken to preserve to posterity the fish supply."

Digitized by Google

We believe that the rivers, streams and other waters of our Commonwealth were divined for the well being of all people within its borders and not for any individual. Pollution renders water a menace to human health and unfit for domestic purposes or for the maintenance and increase of aquatic animal food, among which fish is the most important. It may be stated as an axiom that water polluted to an extent which will prevent fish from inhabiting and thriving therein is generally deleterious to human and animal life and is unfit for domestic purposes.

Since a complete understanding was not arrived at with Maryland concerning the fisheries in which that and this State have an interest, and the fact that the State of Delaware did not take any legislative action on the same subject, your Commission respectfully recommends that another Commission be appointed by joint resolution of your honorable bodies to again meet with Maryland and Delaware and also on account of community of interests with the State of New Jersey. A joint resolution to this effect is herewith appended as part of this report.

On account of diversity of laws enacted by States and by the Dominion of Canada governing the fisheries of waters forming the boundary line between the United States and the British possessions in North America, and on account of the evident futility of any of them to secure uniformity in the near future, the Federal authorities have apparently decided that the National Government shall take over the control and direction of the fisheries of the waters hitherto under the sovereign control of the States, and to attempt to have enacted international laws covering the subject.

As a first step in this direction, a treaty was concluded by and between the United States of America and His Majesty Edward VII of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the seas, King and Emperor of India, dated April the eleventh, A. D. 1908, by which an International Fisheries Commission was appointed to prepare a system of uniform and common international regulations, restrictions and provisions for the protection and preservation of food fishes in the waters described.

The International Commission has been in consultation with the Commissioner of Fisheries of this Commonwealth concerning proper laws for the protection of fish and the encouragement of the fishing industry in Lake Erie, in which citizens of our Commonwealth are interested financially to a greater extent than is the Dominion of Canada, or any other state excepting Ohio. From what we can learn, the Commissioner of Fisheries of this Commonwealth has rendered most valuable service in this particular, but this Commission feels that he should be given assistance to continue successfully his efforts, presuming that the Federal authorities are sure of their ground in declaring an intention to assume control of fisheries hitherto exercised under the sovereign power of Pennsylvania. The Commission believes that, apart from the other purposes already set forth in this report, a new Commission should be appointed to further the efforts of the Commissioner of Fisheries to induce the International Commission to frame a law which will be equitable to the Pennsylvania fisheries of Lake Erie and insure continued increase of fish in that great body of water.

Digitized by Google

Your Commission appointed by a joint resolution at the session of the Legislature of 1905, were of the opinion as well as the New Jersey Commission that it was desirable to establish on the Upper Delaware, either in New York, New Jersey, or Pennsylvania, a large fish hatchery, to be supported by the three states for the propagation, on a great scale, of black bass and other warm water fishes.

The establishment of such a hatchery would be beneficial and important. Such a plant financed by the three states and operated under the direction of the Commissioner of Fisheries of this State, or of the Commissioner of Forestry, Fish and Game of New York, would result in a great output of fish for the three states and a consequent increase of fish life therein.

We exceedingly regret to report the death of one of the most active and interested members of the Commission, the Honorable Algernon B. Roberts, which occurred last January.

HENRY F. WALTON,
FREDERICK A. GODCHARLES,
WEBSTER GRIM,
F. B. McCLAIN,
JAMES N. HUNTER,
HIRAM J. SEDWICK,
ALFRED MARVIN,
W. E. MEEHAN.

INTERSTATE CONFERENCE ON POLLUTION OF THE OHIO.

The Ohio river is among the streams badly polluted, but, under normal circumstances, certain species of fish manage to exist, especially after the Pennsylvania line has been passed. One day early in July thousands of fish were suddenly killed and thousands more died in the following two or three days. An investigation showed that this death rate was caused by pollution from some establishment not far from Pittsburgh.

The great slaughter of fish aroused the people along the river in Pennsylvania, West Virginia and Ohio to a great state of indignation, which resulted in a conference being called in Pittsburgh of fishery officials of Ohio, West Virginia, Pennsylvania and the United States Government. Ohio was represented by the Honorable George W. Cook, Fish Commissioner, and John C. Speaks, Chief Warden. West Virginia by J. A. Viquesney, Chief Warden, and Colonel T. M. Darrow, of Wheeling. Pennsylvania by myself, and the United States Bureau of Fisheries by Dr. J. Percy Moore. The conference was held September 20th, Dr. Moore presiding. There was also present a representative of the Tri-State League of Western Pennsylvania, Ohio and West Virginia.

The pollution of the Ohio was admitted and that the chief offender was Pennsylvania, although it was shown that both Ohio and West Virginia contributed to a lesser extent. The conference developed the fact that the State of Ohio had no jurisdiction over any part of the Ohio river and that laws affecting that stream could only be enacted

Digitized by Google

by Pennsylvania and West Virginia. It was shown, however, that any law which the State of Ohio might have in relation to pollution could be enforced on any plant located on the banks of the river. It developed also that the State of Ohio did not have an anti-water pollution law in so far as fish were concerned. Both the Pennsylvania and West Virginia laws were read and while each were found to be enforceable, that of Pennsylvania was deemed the better and the conference unanimously adopted the following preamble and resolution:

Wheras, it is the sense of the members of the conference, consisting of officers of the United States Government, Pennsylvania, West Virginia and Ohio, that the purification of the Ohio river and its many tributaries can only be brought about by identical or similar laws in the several States forbidding pollution from industrial establishments; therefore,

Resolved, That the Ohio officials be asked to endeavor to have the Legislature of that State enact a law identical with or similar to the Pennsylvania law as found in Section 16 of the Act of May 1, 1909, P. L. 207, of that State, commonly called the "fish code"; and,

Resolved, That the representatives of the United States Bureau of Fisheries and men of this conference be requested to make representations to the United States Fish Commissioner of the situation on the Ohio with a view of inducing him to bring about the introduction of a bill into Congress to prohibit the pollution of all waters over which the National Government has any jurisdiction whatever.

The conferees were emphatic that the existing laws of Pennsylvania and West Virginia should be enforced on the Ohio river, but it was agreed that in the enforcement a reasonable time should be given to each manufacturer to provide methods of disposing of their waste material other than by emptying it into the river. The question of pollution by sulphur water from the mines was discussed. It was pointed out that a Supreme Court decision at present protected the mine owners in this pollution and further that until the sewage from cities and towns could be disposed of otherwise than by allowing it to be emptied into the river, it would be inadvisable and against public policy for the fishery authorities to interfere since sulphur water, under such circumstances, became a natural preventative of diseases like typhoid.

LAWS FOR THE DELAWARE RIVER.

By a joint resolution of the session of the Legislature in 1905 a special commission was appointed to confer with similar commissions to be appointed by the states of New Jersey, Delaware and New York, for the purpose of drafting uniform bills relating to the fisheries of the Delaware river for enactment at the next session of the respective Legislatures. The Pennsylvania Commission consisted of Senators Algernon B. Roberts, Frederick A. Godcharles and Webster Grim, with President Pro Tempore A. E. Sisson as ex-officio; the Hon. Frank B. McClain, Speaker of the House; Representatives Hiram J. Sedwick, Alfred Marvin and Joseph N. Hunter; Commissioner of Fisheries W. E. Meehan and Henry F. Walton, ex-Speaker of the House of Representatives, who, under the provisions of the joint resolution, was appointed by the Governor.

Digitized by Google

New Jersey appointed a commission consisting of Senators Edmund W. Wakelee, Joseph S. Frelinghuysen, President of the Senate Thomas J. Hillery, Assemblymen Austin Colgate, Oliver C. Holcombe and Henry D. Thompson, President of the Fish and Game Commission B. C. Kuser and Dr. Henry Van Dyke, of the Princeton University, who was appointed by the Governor of the State of New Jersey, John Franklin Fort. Neither the State of New York nor the State of Delaware appointed commissions, but the State of New York was represented through appointment by its Forest, Fish and Game Commissioner, John S. Whipple, of Dr. Tarleton H. Bean and John B. Burnham. The Commissioners of the two states and the representatives of New York held a number of sessions, which resulted in the framing of three bills, one governing the fisheries of the Delaware river from Marcus Hook to Trenton, the limit of tidewater; a second, from Trenton to below Port Jervis, New York, the northern limit of the State of New Jersey, and a third for the river from Port Jervis to the headwaters of the Delaware. The bills were presented to the Legislatures of New Jersey, New York and Pennsylvania simultaneously. Those offered in Pennsylvania and New Jersey were adopted and signed by the Governors. They were identical in every respect save one, the one relating to sturgeon fishing, which is unfortunate because, as a result, below Trenton Falls there can be no prosecution for catching sturgeon any time of the year with legal nets. The other relates to parallel nets, and as this device is set above low-water mark is enforceable according to law of either state. This refers to the law below Trenton Falls. The acts for the Delaware river between Trenton Falls and Port Jervis are identical in every respect. Unfortunately, the law relating to the Delaware river above Port Jervis failed of passage in New York Legislature, and as some objectionable amendments were made in the act passed by the Pennsylvania Legislature I felt compelled to ask the Governor to impose a veto, which he did on the ground that New York did not pass a similar act. The two acts relating to the two different sections of the Delaware river now on the statute books of Pennsylvania and New Jersey appear to be as nearly perfect, with the exception of the clause relating to sturgeon fishing in the lower river, as can be devised and enacted by a Legislature. It is based on the same plan as the act of May 1, 1909, governing the interior waters, viz: in the classification of fish and the setting forth the means, time and size of fish that may be caught.

With these two acts for the Delaware, with the new code for the interior waters, with the act governing the fisheries of Lake Erie, Pennsylvania now has a series of laws relating to fish of which it may well be proud and which I believe to be superior to almost any state in the country. They are less drastic than some states, more restrictive than some, but fair alike to the fish and the fishermen. Through a strict observance of the three laws the chances for the increase of fish life in the waters under the control of Pennsylvania is greatly increased.

Digitized by Google

THE NEW FISH CODE.

After an enforcement of five years of the Act of May 29, 1901, by this Department its strength and weaknesses became clearly apparent. It was evident that in the main the act was good, for by its enforcement the fishery interests of the State had been materially assisted. It was the best thought of fish protectors at the time it was enacted. As might be expected, there were some weaknesses. Conditions had also changed in some respects and it was evident that changes were necessary both to remedy the weaknesses if possible and to meet the changed conditions. There were some features of the act of 1901 objected to by a few, with which this Department had no sympathy, as, for example, an objection to the arrest and conviction of a person for using an unlawful device where no fish were actually caught, or the conviction for the use of a lawful device at a period when it was unlawful to catch fish with such. To abrogate such a law would be to open the doors to destructive fishing which could not be suppressed. The principal weaknesses in the act of 1901 were obscurities. In addition, since 1901, several acts had been placed upon the statute books at various sessions of the Legislature. Some were good and some were operating badly. Feeling that the undesirable acts should be repealed and obscurities cleared up and new conditions met, at my request a convention was called of Fish Protective Associations and sportsmen from all parts of the State. The convention was held in Harrisburg the last of October, 1908, and occupied two days, and a bill was drafted. It was subsequently submitted to every organization in the State having interest in the protection of fish and suggestions asked for. The suggestions were considered by a committee appointed by the convention, and those which were deemed wise were adopted. When the bill was completed it was given to the Attorney General and in due time by him handed to Representative E. E. Jones, Chairman of the Fisheries Committee of the House, for introduction. A number of changes were made by the Fisheries Committee, some of which, on my responsibility, were stricken out, others were retained and a bill finally passed and was approved by the Governor May 1, 1909.

A few of the changes made I consider unfortunate and should be remedied at the next session of the Legislature. There were also some typographical errors not noticed until after the Legislature had adjourned, which need correction at the next session. Taking it as a whole, however, the new fish code of May 1, 1909, is far superior to the act of May 29, 1901. One strong feature of the new law is that all the important provisions are to be found in the first three sections. The first section divides all fish in the State into three classes, game fish, food fish and bait fish. Certain fish are specifically named as game fish and certain species as bait fish and all other fish of any kind or character are described as food fish. The second section prohibits the use of any device, means or method whatsoever for taking fish from the waters within this Commonwealth excepting by means specifically named in the section; forbids fishing of any kind on Sunday, and forbids punishment of persons who may catch an out of season fish provided if it is returned to the water promptly. Section 3 states the

Digitized by Google

open and close seasons for fish, the length of fish that may legally be caught and the number that may be taken daily, and also sets forth clearly the manner of measurement. With few exceptions the remainder of the sections of the act describe the methods by which lawful devices may be used and the lawful manner of the disposal of the fish.

Among the exceptions are some very important provisions defining the character of streams, a prohibition against polluting streams to an extent that will injure fish or fish food, duties of the Department of Fisheries, and the legal procedure.

Under the act of May 29, 1901, the legal procedure was what is known as summary conviction, but the provision was vague in that it did not clearly set forth what disposition should be made of a defendant pending an application for an appeal on cause shown. Some justices of the peace and some citizens were of the opinion that if a defendant was found guilty by a justice of the peace, even though he gave notice of intention to ask for an appeal, the fine must be paid, or, as an alternative, be sent to jail. This was never the interpretation of the Department nor do I believe that it was the proper interpretation of the law. In the act of May 1, 1909, this obscurity was made clear by the insertion of the words in Section 27: "Provided, that in case the defendant or defendants shall neglect to pay, at once, the fine or fines so imposed, said defendant or defendants shall forthwith be sentenced to undergo imprisonment, in the county jail of the county where such conviction takes place, for a period of one day for each dollar of the fine so imposed and unpaid, unless the defendant or defendants, upon conviction, shall give notice of intention to appeal, when such defendant or defendants shall be permitted to enter into good and sufficient recognizance to appear before such justice, alderman or magistrate, on or before the expiration of five days, if such appeal is not taken by them or on the final determination of such an appeal if it be not sustained, for execution of sentence": This it might be supposed would be clear to anyone, but it seems there are still some who do not comprehend the real significance of the above quoted clause. There are some justices who seem to think that where an intention to appeal is announced the recognizance should be given to appear not before them but before the court, and on several occasions, since the new law has gone into operation, this misapprehension has had to be corrected. There are some people also who seem to think that this clause is a declaration of a right to appeal as a matter of course, and that whether or not their conviction was according to law and evidence they only had to express their intention and that the court would grant the appeal as a matter of right or course. This is an error. The situation is exactly the same as it was under the act of 1901, viz: that a person convicted by a justice of the peace or magistrate of violating the fish laws can only ask the court for permission to appeal and if the defendant cannot show cause, that is to say, oppression, corruption or disregard of law or evidence, the Court of Quarter Sessions will refuse the appeal. Neither can the justice of the peace hold the defendant in bail to answer to court. He can only hold in bail to appear before him again for execution of sentence when the court has disposed of the application for appeal, or if the application is granted if the court upholds the sentence of the justice or magistrate.

Digitized by Google

Under the act of 1901 one-half the fines collected went to the informer and the other half was paid into the State Treasury through the County Treasurer and Commissioner of Fisheries. In principle I consider this provision equitable if the State maintains special wardens who are not paid any salaries. It should not be looked upon as a reward or an inducement to prosecute, but as a substitute for a regular salary. Unfortunately there were both special wardens and citizens who did not regard the matter in a proper light. There were a few wardens who looked upon the matter as a reward and as a means for making money. There were citizens who thought that all special wardens held this erroneous view. The system of paying half the fines to wardens therefore naturally fell into disrepute and I felt it was not good for the service that such a law should continue when it had such a reputation. The Legislature agreed and under the act of May 1, 1909, the payment of half the fines to anyone was abolished. The special warden service is continued with modifications, and I am pleased to say that the majority are performing their duties notwithstanding they are receiving no compensation of any kind. The number of arrests by this class is not as great as in former years when the half fine system was in vogue, but this is natural since most of the special wardens appointed under the law at the request of Fish Protective Associations, are for the moral effect in the community and almost in every instance are members of the organization. When the occasion arises these men make arrests, but the moral effect has been beyond calculation. For example, in the county of Chester, where each organization has from three to ten of its members special wardens, illegal fishing has been reduced to a minimum and it is scarcely necessary for the regular warden of the district to go through the county more than twice in a year.

A very important provision in the new code relates to the operation of commercial hatcheries for fish. This industry, which struggled manfully under a severe, restrictive and unfavorable section of the act of 1901, has, under the new act, taken a vigorous start and a number of concerns are about to start into business, which will next year double the number of establishments already existing.

Among the unfortunate provisions inserted in the bill was one to permit gigging in streams not inhabited by trout during the months of July, August, September and October. The gig or spear is one of the most destructive devices known and the experience of the Department is that more than 90 per cent. of those who use the gig or spear, whether intentionally or unintentionally, kill game or food fish which may not be taken by that device lawfully. It is not a device advocated by market fishermen, who believe in the use only of devices which are not overly destructive. I believe the provisions authorizing the use of gigs or spears should be repealed at the next session of the Legislature and the device made unlawful at any time of the year. Notices have come within my observation where men who desire to use the gig or spear in waters in which the device is now prohibited, have vehemently declared, in the face of evidence to the contrary, that the waters do not contain the type of fish which would bar the instrument. The spear, therefore, should be abolished entirely, or prohibited in any water, since a partial restriction is a temptation to untruthfulness almost approaching perjury.

Digitized by Google

Another very important matter was the striking off of the sunfish from the list of game fishes. It was placed in that class by the act of 1901. With the exception of one species of the four commonly found in Pennsylvania waters it is well worthy of being on the game list. It takes an artificial fly with all the snap and eagerness of a brook trout. On light tackle it gives a short but delightful play and is as worthy of being classed as a game fish as either the brook trout or black bass. Its flesh is of very high quality, and it can be made abundant in any waters in which the brook trout would not thrive and in which it is not advisable to have black bass, and, indeed, where the small mouth black bass could not thrive. I believe if the friends of the sunfish had been satisfied with a simple open and close season it might not have been stricken from the list, but they insisted not only on a close season but also on a minimum size and a maximum number per day to be caught. A minimum size on account of the species known as the yellow sunfish was difficult of enactment, and moreover unlike trout or other fish it is extremely difficult to use a hook which the sunfish could not swallow, consequently in bait fishing it was almost a certainty that at least 75 per cent. would be killed by the hook. Sunfish fishing moreover is considered by a very large class as a sport which could be particularly enjoyed by ladies and children. The latter could hardly be considered responsible if they caught and killed a small sunfish or more than a certain number, and consideration for the former called for a not too drastic law for a fish which they delighted to catch. This formed a large class who were dissatisfied with a minimum size and a maximum number. There is another class in the northeastern part of the State in which are located natural lakes. Here the sunfish, the species known as the long-eared and common, are so abundant as to be considered a nuisance by many while fishing for larger game fish. This class objected to the fish being protected at all, and the two classes united and succeeded not only in defeating the proposition to provide a minimum size and maximum number, but also its continuance on the list of game fishes. Alone the opponents of the sunfish as a game fish, I believe, could not have effected their purpose. Alone the opponents of the minimum size and maximum number could not have succeeded, in my estimation. I believe that at the next session of the Legislature the sunfish should be restored to the list of game fish, simply with a close season, as was provided under the act of 1901, the same close season as is given black bass.

It is important, in my estimation, that it should be restored to the list of game fish. The demand for the species, especially for the one known as the Lake Erie or blue-gill, is increasing greatly, and the Department is engaged in its propagation and the number sent out annually is now nearly equal to the number of black bass. Where the demand for any particular fish is as great as is the demand for the sunfish and it has game qualities, it should be placed on the list of game fish, unless its interests are overwhelmingly of the market as, for example, the striped bass. While the blue-gill and even the long-eared sunfish have a market value they are distinctly fish caught for sport.

Digitized by Google

LEGISLATION FOR FROGS AND TERRAPIN.

Among the bills presented was one intended to replace the present very defective law now on the Statute Books relating to frogs and fresh water terrapin. As food products frogs and fresh water terrapin occupy a very high and important place. The industry in the State of Pennsylvania in marketing frogs is huge. The Department propagates them on a large scale, and even under the defective law now on the statute books this valuable food product has materially increased. I drafted a bill remedying the defects and which, if enacted, would have protected the industry in frogs and fresh water terrapin. I am glad to say that there was no objection whatever to the bill in the Legislature. Unfortunately when first reported it found a place behind a number of other bills of other interests, which, for one reason or another remained on the calendar throughout the session, and it happened that it was impossible to get the frog bill away from these obstructions and it did not pass the House until too late in the session to pass the Senate. The old defective and undesirable law therefore remains on the statute books.

INTERNATIONAL CONTROL OF BOUNDARY WATERS.

In my last report I drew attention to the fact that the United States Government proposed to take possession of the fisheries of the waters forming the boundary line between the United States and Canada in connection with the British Government. This, it was proposed to do under a treaty signed between the two governments on April 11, 1908.

Professor David Starr Jordan, President of the Stanford University, California, was appointed by the Washington authorities, to represent the United States Government, and Mr. S. Bastedo, by the Canadian authorities, to represent Great Britain, to draft regulations governing the fisheries in these waters to be presented to their respective governments. Mr. Bastedo subsequently resigned, and Prof. Prince, of Ontario, was chosen by the Canadian Government, in his place.

Several drafts of proposed regulations were made and in each instance confidential copies were sent to me and to other Commissioners. As a rule the proposed regulations seemed to be equitable, and in the interests of fish and the fishermen, but there were only two provisions in one of the drafts which were not in accordance with the modern practice of fish culture. One was a proposal to have a close season for certain non-nest building fishes. I submitted this matter to the State Board of Fishery Commission and owing to my representations a series of resolutions were sent to Dr. Jordan and Prof. Prince advocating the abolition of any close season for fishes like white fish, lake herring, blue pike, pike-perch and other non-nest building fishes.

Digitized by Google

This stand had previously been taken by the National Fisheries Society and discussed in the International Fisheries Society which met in Washington in September, 1908. In the latter organization, while no vote was taken, the consensus of sentiment was almost unanimous for an open season, especially during the spawning season.

I understand that after the receipt of the resolutions this view was adopted by the International Commission, but there are one or two other provisions still remaining which I feel are improper, unnecessary and likely to work undue hardship on the fishermen. It may be that they have been removed also. It is to be hoped they have as they will mar otherwise nearly perfect regulations. The report of Prof. Jordan has been presented to the President and the Secretary of State, and doubtless the provisions will be made public before long.

INTERNATIONAL CONTROL OF STATE BOUNDARY WATERS.

I believe it will be necessary for the Federal Government to assume charge of the fish protection in streams forming the boundary line between States. Efforts have been made by Pennsylvania to secure uniform legislation for the Delaware river and have only succeeded with the State of New Jersey. The laws between Pennsylvania and New York are similar but not uniform and are very unsatisfactory. The fishery legislation between the States of New Jersey and Delaware is conflicting. As long as such a state of things exist it is impossible to adequately increase the fish supply of the Delaware river and the fish cultural work of Pennsylvania for that stream is seriously hampered.

I understand that similar conditions exist in almost every instance where streams form boundary lines between the two States. Pennsylvania now has a Commission to make another effort to induce Delaware and New York to adopt the same law as Pennsylvania and New Jersey, but I confess I have but little hopes of success.

PURIFICATION OF THE STREAMS.

Contemporaneously with fishery work by the State there have been laws providing against polluting the streams to an extent destructive to fish life and the enforcement of these laws have been in the hands of the State fishery authorities. Unfortunately, for a number of years laws of this character were very difficult of enforcement owing to their peculiar phraseology. Neither was public sentiment aroused to the importance of the question. The continuance of manufacturers in the matter of the disposal of their waste was overwhelmingly regarded as paramount. Neither public health nor the fisheries were deemed as of great a moment as the money expenditure which would be necessary by the manufacturer in order that both might be conserved. The popular feeling was that the

Digitized by Google

streams were natural sewers provided by nature for the reception and disposal of all manner of filth. For many years it seemed utterly impossible to make any headway against this impression. Every attempt at legislation to bring about better water conditions was a failure.

Medical authorities, people interested in the maintenance of fish life, were not discouraged and waged a campaign of education and their hands were strengthened by the growth and increased importance of the fisheries, but it was not until nearly all the large streams in the State became badly polluted and thousands of smaller streams in a worse condition, that the public became fully aroused.

A section in the fish code of 1901 may be considered as the first step in a new order of things, but even this provision was defective in that the enforcement was in very narrow lines and even then only rendered in any wise effective by the support of the Superior Court of the Commonwealth. The creation of the Department of Health with very broad powers was a second and decided step.

A section in the new fish code of 1909 appears to be the capping stone of legislation for the purification of the waters of Pennsylvania. It places in the hands of the Department of Fisheries powers nearly as broad and comprehensive as the Department of Health. It covers forms of pollution that appears not to be embraced within the jurisdiction of the other named machinery of the Government. The section reads as follows:

"That it shall be unlawful for any person to put or place in any waters within the Commonwealth any electricity, or any explosive or poisonous substances whatsoever, or any drug, or any poison bait, for the purpose of catching, taking, killing, or injuring fish, or to allow any dye stuff, coal or gas tar, coal oil, saw dust, tan bark, cocculus indicus (otherwise known as fish berries), lime, vitriol, or any of the compounds thereof, refuse from gas houses, oil-tanks, pipes, or vessels, or any deleterious, destructive, or poisonous substances of any kind or character, to be turned into, or allowed to run, flow, wash, or be emtpied into, any of the waters aforesaid, unless it is shown to the satisfaction of Commisioner of Fisheries, or the court, that every reasonable and practicable means have been used to prevent the pollution of waters in question by the escape of deleterious substances. In the case of the pollution of waters by substances known to be injurious to fishes or to fish food, it shall not be necessary to prove that such substances have actually caused the death of any particular fish;

Provided, That nothing in this section shall prohibit the use of explosive for engineering purposes, when a written permit has been given thereof by the proper national, state or municipal government. Any person violating any of the provisions of this section, shall, on conviction as provided in section twenty-seven of this act, be subject to a fine of $100."

The enforcement of the above provision is naturally attended with many serious problems. The manufacturing interests of the State are huge and some of them use vast quantities of water daily. There are concerns in the State who use 10,000,000 and 12,000,000 and more gallons per diem, the greater part of which flows into the streams badly polluted, often injurious not only to fish life and fish food, but to human health as well.

Digitized by Google

To step in and arbitrarily order the abolition of such pollution within a few days or even a month would be impossible of accomplishment, unjust to the manufacturer and probably result in the closing down of his establishment. It seems only equity that the manufacturer shall have time to devise some means to properly observe the law. Ordinary subsiding basins are not always effective, neither are ordinary filtration reservoirs. The cleansing of the streams even under such an admirable act as is now on the statute books must therefore be accomplished slowly.

I believe also that the work of purifying the waters can be brought about more rapidly and effectively by securing the co-operation of the owners of industrial establishments and I am proceeding on that line. The results have fully justified my position. With very few exceptions I have found the manufacturers willing to give cheerful compliance with the law only desiring to find a way to do it without practically putting them out of business.

Since the enactment of the new law it has only been necessary to take legal proceedings in three instances. In two of these cases the suits were withdrawn on the payment of costs and the owners of the establishments taking steps to obey the law. The third case is now in the courts.

The new law has brought to the front a number of patented devices more or less effective. Some for special industries and some for general waste. It is, of course, impossible for this Department to recommend any such apparatus. It has, however, been able to recommend one or two special unpatented methods of purifying water polluted by particular materials. Prominent among these may be mentioned a filter for wastes from gas houses. With the enactment of the new law I began a study of the conditions in the entire State. I found that there are about 7,000 manufacturing establishments polluting the waters to a greater or less extent.

The greatest serious pollution exists in the western part of the State. More than half the streams were either rendered wholly or partially uninhabitable by fish life. The Ohio river, a large portion of the Allegheny, the whole of the Clarion, the whole of the Kiskiminetas, the whole of the Conemaugh, most of the Youghiougheny, were little more than open sewers. The Clarion was perhaps the worst.

In the eastern part of Pennsylvania the pollution is not so general. Among the worst streams are the waste from the tanneries, oil refineries and paper manufacturers. Most of the owners to-day take care of what is known as the tannic acid waste and make a profit thereby. They all take care of their washings but nearly all of them still allow the fleshings to flow into the streams. The fleshings is perhaps the most repulsive as well as the most dangerous of the pollution from tanneries. It contains a vast quantity of organic matter in the way of particles of flesh, manure, dirt, etc. It is a great breeder of bacillus of a harmful character with a smell so foul as to be sickening.

Initial experiments conducted by the Elk Tanning Company showed much valuable material to be saved and bring to the owner a profit. Unfortunately, the initial experiments, while attaining this, were not effective in making the residue suitable to be emptied into the streams. Experiments conducted by the Department corroborated the

Digitized by Google

finding of the Elk Tanning Company, but while the apparatus is not perfect there is reason to believe that before another year has passed, pollution from the washings will be a thing of the past in Pennsylvania.

Satisfactory process is also being made in providing means for waste from oil refineries and from the paper manufacturers. At the time of the preparation of this report the upper Allegheny river is clear of the worst pollution. The counties of Warren, Monroe, Crawford, Chester, Columbia and Erie are entirely or nearly cleared of pollution through the work of this Department.

Every saw mill known to the Department in the State has been compelled to provide other means for the disposal of sawdust than to allow it to float away in the water. More than 300 establishments have provided or are providing disposal or purifying plants. The following table shows the number and character of the plants which are thus providing for the disposal of their dangerous waste:

Nothing at present can be done with the sulphur water from the mines. Even if there were no means of purification, it is doubtful whether it would be for the best interests of the people to enforce such purification until city sewage can have been disposed of. The sulphur water, I understand, is in many cases where city sewage exists, a preventative of disease.

A QUESTION OF NAVIGABLE WATERS.

Conneaut Lake in Crawford County is the largest lake in the Commonwealth of Pennsylvania. As far back as 1798 the Legislature declared that the lake and Conneaut Creek to be public streams and highways. When the Commonwealth began the building of canals it used Conneaut Lake as a feeder and for the purpose of increasing its storage capacity raised the level of the lake. The canal was afterwards sold and the holding company becoming bankrupt the property was sold at sheriff sale, the title of Conneaut Lake becoming finally in the possession of the Conneaut Lake Ice Company, or so much of a title as could be passed by the sale. The lake was lowered to its original level, which left a strip of land around the whole lake with one exception. The Conneaut Lake Ice Company executed long leases to the land around the lake to various tenants, the main purpose seeming to be in the leases to preserve the purity of the water, so that the ice which the Ice Company was primarily formed to gather should be kept pure.

Under their title the Conneaut Lake Ice Company claimed exclusive control of the waters and shores of the lake, and, charged everyone who navigated boats upon the lake a certain license fee. Amos C. Quigley and H. E. Roads held a lease on part of the Ice Company's land, and across these lands they took a motor boat, which it was averred they intended to use for the transportation of passengers and freight. For years the Ice Company had given to the Navigation Company the exclusive monoply of running boats for the transportation of passengers and freight, and of course the Navigation Com-

Digitized by Google

pany complained that their rights were being infringed. Thereupon the Conneaut Lake Ice Company filed a bill in equity in the Court of Common Pleas of Crawford County asking for an injunction restraining Quigley and Rhoads from operating their boat. A preliminary injunction was granted, but was finally set aside by the court, and from this judgment the Ice Company appealed to the Supreme Court, which sustained the Lower Court in its assumption that Conneaut Lake is a navigable body of water held in trust for the citizens of the Commonwealth. The following is the opinion of the Court:

In the Supreme Court of Pennsylvania, Eastern District.

Conneaut Lake Ice Company, Appellant, vs. Amos C. Quigley and H. E. Rhoads.	No. 143 January Term, 1909. Appeal of Conneaut Lake Ice Company, from the Final Decree of the Court of Common Pleas of Crawford County, Sitting in Equity.

Filed October 11, 1909.

Potter, J.

The Conneaut Lake Ice Company, a corporation, filed this bill in equity in the court of Common Pleas of Crawford County against Amos C. Quigley and H. E. Rhoads, in which it averred that it was the owner, and in possession of Conneaut Lake, the lands thereunder and the waters thereof, and of the lands immediately adjoining and surrounding the lake; that as a consequence it had the exclusive right to control and navigate the waters of the lake, and to control the lands bordering upon it; that the defendants, who as tenants under it, held certain lands abutting on the lake, had, in violation of the plaintiff's rights, as well as of the terms of their leases, launched and placed upon the lake, a certain boat intended to be used for the transportation of passengers and freight upon the lake for hire. The plaintiff prayed for an injunction to retrain the defendants from continuing to use such boat, or any other boat, for the navigation of the lake, and from placing any other boat on its waters.

The defendants, by their answer, claimed that the lake was part of the public waters of the Commonwealth, and therefore they were entitled to use and navigate its waters, and denied that they had invaded any of the plaintiff's rights or violated the terms of the leases under which they occupied lands adjoining the lake.

The court below granted a preliminary injunction, but upon final hearing (Criswell, P. J., specially presiding) dismissed the bill at plaintiff's cost. Plaintiff has appealed from the decree dismissing the bill. Counsel for appellants have filed fifty-six assignments of error, of which only one is in compliance with the rules of this court. Assignments one to five inclusive are not printed, being admittedly bad, as not based on any exception. Other assignments are to the admission of evidence, offered by defendants, but the evidence is not set out as required by Rule 31. In other assignments to various findings of fact and law, exceptions were filed, but the dismissal of the exceptions is not assigned for error. Assignments twenty-four to forty-six inclusive, are to answers for requests submitted by plaintiff for findings of law and fact, to which no exceptions were seemingly taken. Other assignments complain of the failure of the trial

Digitized by Google

judge to find certain facts, as to which no specific requests for findings were made by plaintiff. Assignment fifty-four alleges as error, the decree dismissing plaintiff's exceptions, and confirming and making absolute the decree nisi, but neither the exceptions nor the decree nisi, are set out in this or any other assignment. Assignment fifty-five complains generally of the dismissal of one bill at plaintiff's costs, but does not set out the decree. Assignment fifty-six assigns for error the final decree dismissing plaintiff's bill. This assignment is in proper form, and raises all the questions which need to be considered.

The Act of March 21, 1798 (3 Sm. L., 320), declared certain streams and waters, including "Little Coniate creek from the mouth up to the inlet of Little Coniate Lake" to be public streams and highways for the passage of boats and rafts. The court below has found as a fact that the creek and lake referred to in this act, under the name of "Coniate" are the same as those now known under the name of "Conneaut." There is ample evidence to sustain this finding, and it will not be disturbed. So that without regard to the question of navagability in fact, we have the legislative declaration that in view of the law, Conneaut Lake is to be considered a public body of water, subject to the right of navigation by the public. When a lake is so small as to be properly regarded as a mere pond, there is no sufficient reason for the public to assert any right in it. But that is not the case here. The navigability of Conneaut Lake as a fact must, under the testimony, be conceded. The court below has found from undisputed evidence that during the period since 1903 the travel upon the lake during the summer, and especially during the excursion season has been large, being estimated as high as 150,000 passengers in a season and, during the summer of 1908, the Navigation Company operated eight boats, some of them large enough to accommodate 250 passengers. The navigability of the lake is expressly recognized in the agreement between the plaintiff and the Navigation Company, in which a monopoly of the navigation of the lake is attempted to be secured. The Navigation Company agrees to maintain sufficient boats on the lake to reasonably accommodate the business, and to accomodate to the full capacity thereof the traffic to and from the Exposition Park. It certainly does not lie in the mouth of the plaintiff company to deny that Conneaut Lake is navigable in fact. If it is navigable in fact, then it is to be so considered in law. Counsel for appellant admit this is the proper test as to rivers, but they deny its application to lakes. Why should there be any distinction?

The use to which the body of water may be put is the true criterion. If the body of water is sufficiently large and deep to serve the public in providing transportation to any considerable extent upon its bosom, it is sufficient to give the public an easement therein for the purpose of transportation and commercial intercourse.

We have so few lakes of large size in Pennsylvania that the question of the rights of the public with regard to navigable lakes does not seem to have arisen. But in Wisconsin and in Minnesota, where lakes abound, the precise point has been decided. In Pewaukee v. Savoy, 103 Wis., 271, it is said, "It is the settled law that submerged lands of lakes within the boundaries of the state belong to the state in trust for the public use, substantially the same as submerged lands under navigable waters at common law. Upon the admission of the state

Digitized by Google

into the Union the title to such lands, by operation of law, vested in it in trust to preserve to the people of the state forever the common rights of fishing and navigation, and such other rights as are incident to public waters at common law, which trusteeship is inviolable, the state being powerless to change the situation by in any way abdicating its trust." And in Lamprey v. State, 52 Minn., 181, Justice Mitchell, after an interesting examination and review of the authorities, says "Our conclusion, therefore, is that upon both principle and authority, as well as consideration of public policy, the common law is that the same rules as to riparian rights which apply to streams apply also to lakes, or other bodies of still water. In this State we have adopted the common law on the subject of waters, with certain modifications, suitable to the difference in conditions between this country and England, the principals of which are, that navigability in fact, and not the ebb and flow of the tide, is the test of navigability, and that we have repudiated the doctrine that the State has any private or proprietary right (as the king) in navigable waters, but that it holds them in its sovereign capacity as trustee for the people for public use." And the rule was laid down, "that where a meandered lake is non-navigable in fact, the patentee of the land bordering on it takes to the middle of the lake; that where the lake is navigable in fact, its waters and bed belong to the State in its sovereign capacity, and that the riparian patentee takes the fee only to the water's edge." The reasoning upon which this opinion rests appeals to us, as it did to the trial judge, in the present case.

We think it enunciates a sound principle and sets forth a reasonable rule.

Assuming, then, that Conneaut Lake was a public navigable body of water, when the Commonwealth utilized it in connection with its canal system, it took no private property. It merely made use of a body of water, which it already held for the benefit of the public. It made the same kind of use of it, in part, at least, that it did of the Beaver river, or the Ohio river as part of its canal system. As the trial judge well says: "The authorities of the State conceiving that a further beneficial and advantageous public use could be made of the waters of the lake and the lands thereunder with no material abridgement or impairment of the uses for which it was then held, authorized its further use, without payment or compensation to anyone as a storage basin for the canal. The State did not take or condemn it for such use. It already owned it and subjected it only to additional uses as a public highway for all the people. What the State was then doing was not destroying public highways existing for the use of the people, but endeavoring to provide others for their use."

When the Commonwealth enlarged the lake and raised its level, it overflowed a strip of ground all around the lake. After the abandonment of the canal and the return of the waters to the former level, the question of the ownership of the strip of land thus uncovered arose, and it seems to have been decided that the fee to this land had become vested in the Commonwealth. But we do not understand that the decision had any reference to the ownership of the soil under the lake when in its natural condition.

The defendants are lessees from plaintiff's grantor and assignor for terms of 999 years each. The leases described the premises leased to them as abounded by Conneaut Lake and its meanderings. The

Digitized by Google

leases contain covenants that the lessees will not empty any sewer from the leased premises into the lake, and that they will not cut, or transport across the leased premises any more ice from the lake than they will necessarily consume for their individual purposes, or permit anyone else to do so. Then follows this clause: "And to have no other right to use, occupy or enjoy said lake other than is herein specified and permitted." The penalty for the violation of any one of these covenants is the forfeiture of the lease, the lessors being given the right of re-entry when such forfeiture occurs. Counsel for appellant contend that navigation of the lake with a steamboat owned by defendants is a violation of the covenants of the lease, which equity should enjoin. It is difficult to see upon what ground this contention can be based. The language of the lease is not clear, and it comes within the established rule that in case of doubt and uncertainty as to the meaning of a lease, it is to be construed most strongly against the grantor and in favor of the grantee. The lessor here was very careful to insert covenants against the discharge of sewerage into the lake and limiting the amount of ice to be cut. If it had desired to restrict the lessee in his right to navigate the waters of the lake in common with the rest of the public, the least that it could have done would have been to insert an express covenant to that effect. The construction of the lease for which appellant contends is too doubtful to be enforced by equity. If it can be shown that the rights of the lessor have been infringed, we see no reason why an adequate remedy at law may not be had, or why, if the terms of the lease have been violated, ejectment will not lie, to recover possession of the premises. Equity is not to be used to settle disputed questions growing merely out of the legal rights of the parties.

The assignments of error are dismissed, and the decree of the court below is affirmed. The costs of this appeal to be borne by the appellant.

POWER DAMS.

Three huge dams for power purposes have either been erected or are being built, one in the Susquehanna, one in the Juniata and one in the Raystown branch of the Juniata. This utilization of the water power of these streams began three or four years ago by the starting almost simultaneously of the McCall's Ferry dam on the main Susquehanna and the Juniata Power Company's dam at Warrior's Ridge above Huntingdon. The dam on the Raystown branch about six miles from Huntingdon was begun in 1908. The structure on the Juniata at Warrior's Ridge was only 26 feet high and probably not much more than a thousand feet long and, therefore, was soon completed. The McCall's Ferry dam was designed to be more than sixty feet above low-water mark and about eighty feet from bed rock and about a mile long. It was, in fact, one of the three greatest structures of the kind in the world and the company was capitalized at many millions of dollars.

Digitized by Google

In order to test the legality of such structures I managed to have the McCall's Ferry Power Company taken into the Dauphin County Court through the Attorney General's Department of the State, with the result that the corporation was permitted to continue construction under certain conditions tendering the migration of fish and possible future navigation. During the last panic the corporation got into financial difficulties and was recently sold and the company reorganized. During these difficulties work on the dam was suspended and it is yet unfinished.

In addition to this and the dam on the Raystown branch and the one at Warrior's Ridge, a number of smaller dams for power purposes have been built on several smaller streams tributary of the Susquehanna, and I understand that several others are to be constructed in the near future on the Susquehanna both above and below Huntingdon.

The erection of high dams on the Susquehanna and Juniata, I firmly believe, means the doom of the shad fisheries because this very valuable food fish is exceedingly timid and never would venture in any number through fishways of the types built in dams up to recent years. What they will do with the present type approved by this Department and the United States Government remains to be seen, but if they take to them much more freely than the older types I doubt very much.

Apart from my belief in the inevitable destruction of the shad fisheries, these dams are likely to prove beneficial to the fishery interests so far as other species are concerned, especially such types as the chain pickerel, the Susquehanna salmon, more properly speaking, pike-perch, yellow perch, catfish and black bass. All of these fishes will pass through the fishways very freely and do well in the deep waters above the dams.

It is apparent that the time for the utilization of our water courses for power purposes has about arrived, but it seems to me that the Legislature should fix a statute of these structures, not that the Department of Fisheries may act more intelligently, but that other Departments of the State Government might do so also, and what is of equal importance that the projectors of such enterprises may have a more secure legal status than they now appear to have.

SUPERINTENDENTS' MEETINGS.

One of my first acts as Commissioner of Fisheries was to call all the superintendents of the hatcheries together annually for the purpose of discussing hatchery work; to exchange views regarding the experiences of each in fish propagation; to talk over successes or failures, and to strengthen any weak spots which may have developed or to suggest means of overcoming any difficulties which may have arisen or likely to arise. The meetings proved so successful and of such great benefit that this year I determined to make the meetings semi-annual, one in the office at Harrisburg for two days and two additional days at one or more of the trout stations, and one in the

Digitized by Google

summer of four or five days' duration at two or more of the hatcheries. The innovation exceeded my expectations as to beneficial result. At the meeting here in January the discussions were mainly on trout culture and its various phases, with the result that there were less losses than ever before and a better type of fish distributed. The hatcheries visited at the close of the meeting were Spruce Creek and Bellefonte.

The second meeting was held in July and the hatcheries visited were Corry, a trout station; Union City, a pond cultural station; Conneaut Lake, a pond cultural station, and Erie, a battery station. The meeting concluded with a trip on Lake Erie on the boat the "Commodore Perry" among the pound nets and gill nets in order that the Superintendents not acquainted with the methods of commercial fishermen of Lake Erie might be familiarized. At each one of the stations a meeting was held, presided over by myself, and stenographic notes taken of the proceedings.

The specific object of the summer meeting was to study the bass work at the Union City and Conneaut Lake hatcheries. As an example of the character of the meetings the stenographic report of the meeting held at Conneaut Lake is herewith appended:

Meeting at Conneaut Lake, July 7, 1909.

Mr. Meehan: Mr. Buller, what is the type of your bass pond?

Mr. A. G. Buller: The type of my pond is a sloping bottom with one side shallow and deepening to the other side, the deepest part being five feet. It has a gravel bottom. I built artificial nests for the bass, but some wouldn't take to them, but built natural nests sometimes close to those I made. Oftentimes they could see each other working, but this did not seem to disturb them or cause fighting. I found both artificial and natural nests filled with eggs. I watched them every day and both produced fry. I used to think, and it was generally supposed, that nests should not be nearer than fifteen feet, but my later experience does not bear this out.

Mr. Meehan: Mr. Buller, did you not have cases where two or more nests were very close to one another?

Mr. Buller: Yes.

Mr. N. R. Buller: I had four nests in six inches of water not more than eighteen inches apart.

Mr. Meehan: I often found in the field that nests were not more than three feet apart.

Mr. Safford: My bass nested everywhere, some on mud and some on gravel.

Mr. A. G. Buller: This year I only had ten nests in all. This was on account of having only twenty-four adult fish. Most of them chose artificial nests. They paid no attention to how the nest was placed.

Mr. Meehan: How did you find it last year?

Mr. A. G. Buller: Last year I found very few natural nests. At my place they preferred to take the artificial nest, although my pond is gravel all over. Some were in water less than one foot deep, others in two and two and a half feet. The natural nests were built in two feet of water.

Digitized by Google

Mr. Meehan: How have you found any in deep water?

Mr. A. G. Buller: Have not found them spawning in deep water, but always in less than two and a half feet of water.

Mr. Meehan: I found two or three nests in about seven or eight feet of water and frequently in five or six feet of water in natural lakes.

Mr. N. R. Buller: Mine were in deep water, some in seven feet and several along the shore. In one of the natural lakes my men reported that the majority of the nests were in deep water, especially in Long Pond, where there is little slope.

Mr. Meehan: One nest in Long Pond was in such a depth of water that we couldn't locate it. We could not even locate the nest with a water glass. We knew the nest must be there because of the action of a bass continually in that locality. The general opinion is that the fish will not nest in water at a greater depth than three and a half feet.

Mr. N. R. Buller: Eggs were deposited in my pond on the 21st of June and on the 26th of June eggs were hatched. The water at that time was about seventy degrees. The first nest was cleaned about the 5th of June.

Mr. A. G. Buller: At my place spawning began on the 30th of May.

Mr. Safford: At mine on the 21st of May.

Mr. N. R. Buller: The first nests in the field in Wayne county were between the 25th of May and the 1st of June.

Mr. Whitaker: Most of the nests in Sly Lake, Wayne county, were in about three feet of water, but in Long Pond this year several were so deep that they could not be reached with the net.

Mr. N. R. Buller: This year I noticed particularly that scarcely any preparations were made at all by the fish, but nests were hurriedly made, perhaps because the water was cold until quite late.

Mr. A. G. Buller: I found one natural nest where there was little preparation, grass and gravel mixed together. The result of the hatch was just as good as on any of the nests. Never found any natural nests at the upper end of the pond. Where the water is shallow the water termperature is about one to two degrees different, but the water temperature has nothing to do with it. I do not really know what is the cause.

Mr. Meehan: Mr. Nathan Buller, did your bass seek any particular location?

Mr. N. R. Buller: Last year they went to the western part of the pond and this year to the eastern part. They began about sixty feet out.

Mr. Safford: Mine went all over and had eggs on them twice.

Mr. Meehan: Mr. Haas I believe has the most unfit pond for bass. What have you got to say, Mr. Haas?

Digitized by Google

Mr. Haas: The bass built nests last year in the lower part of the pond, while this year they built at the upper end at the inflow; both artificial and natural. I had five nests, two being natural. One spawned on a pond lily half way down the pond.

Mr. N. R. Buller: The eggs being found in the deep water I attribute to the lateness of the season. The bass went into the deep water on account of the temperature being lower.

Mr. Meehan: Two nests in Long Pond last year were in six and seven feet of water. One nest I found about one hundred feet away in water not less than six inches.

Mr. A. G. Buller: Nathan, you said that your bass spawned last year on the western side of your pond and this year on the eastern side. How do the bottoms compare?

Mr. N. R. Buller: The western side slopes abruptly and the eastern side slopes gradually.

Mr. Safford: My pond is the shape of a flatiron and the spawning area takes in the entire pond with the exception of the kettle hole. Have had nests in both the extreme north and south corners at the same time.

Mr. Berkhous: My pond is the same depth except in the kettle, about two to two and a half feet with the exception of the kettle. The spawning area practically covers the entire pond with the exception of the kettle, and to about twenty feet of the inflow. The fish keep as close to the centre as they can. I attribute this to the people walking around the pond. They deposited their eggs on moss and on gravel too. I did not put in any artificial nests at all as they go outside of the artificial nests and make natural ones. They started spawning on the 15th and 20th of May, both large and small mouth. Practically all spawned within four or five days.

Mr. Meehan: Mr. A. G. Buller, did you notice while your bass were spawning that they were any different, as to size of nests, and quantity of eggs on the artificial and natural ones?

Mr. A. G. Buller: The same proportion. An extremely large amount of eggs on all nests. I had very large breeding fish.

Mr. Safford: My natural nests are always the largest. I find more difficulty in keeping them on the artificial nests than the natural, and hereafter I do not intend to use any artificial nests, but sunshades.

Mr. A. G. Buller: They never went to places where I put gravel without the Lydell boxes, but picked out places at the bottom of the pond where there was no gravel. I put in piles of gravel at different places. They never touched them, but took to the Lydell boxes in preference.

Mr. Haas: Mine went down to the lower end of the pond and built nests in mud and refused to build in gravel although all my bass are small mouth.

Mr. Safford: I lost fifteen nests of eggs this spring. I attribute it to the male being no good, too old. The eggs were fine and healthy.

Digitized by Google

Mr. Hartman: I think this was due to the fish being too weak. There must have been something wrong with the fish at the time of spawning.

Mr. Safford: My fish did not take any food for three weeks before they spawned.

Mr. N. R. Buller: Mine are fed on artificial food exclusively. Have not been able to hold any species perfectly healthy without feeding every day. I feed up to the spawning period. I feed the fish as soon as they are put in the pond, on lungs, liver and curd.

Mr. A. G. Buller: Mine are fed like brook trout. In the fall of the year, when the water begins to get cold, my sunfish and yellow perch will not touch food of any kind until spring.

Mr. Meehan: Have you tried the submerged feeding?

Mr. A. G. Buller: No.

Mr. Meehan: Mr. Berkhous, how about your submerged basket work?

Mr. Berkhous: I have been very successful. My bass will not eat any food except live minnows.

Mr. N. R. Buller: Abraham, at what point of your pond do you feed your fish?

Mr. A. G. Buller: Where the water comes in, I teach the fish to feed.

Mr. J. R. Berkhous: The large mouth bass were fed a year ago last fall. This spring they commenced dying off. In nearly every case it was the small mouth that died, getting poor right after spawning time.

Mr. Meehan: How about yours, Mr. Safford?

Mr. Safford: The first fifteen nests came all together. I went over them every morning. I cannot understand why one species is all right while the other is not. The small mouth did not suffer. It was the large mouth. The first year the large mouth did nothing. I think the males are too old. The eggs, as I have said, were fine.

Mr. A. G. Buller: I gave Mr. Haas thirty-seven also Mr. Safford. Mr. Haas' eggs turned out all right, so I cannot see why it would be the age of the fish. It must be something else besides the age. Something must be wrong with the fish. Mr. Haas has not had his eggs to die as you have, Mr. Safford.

Mr. Safford: Possibly my ponds are too shallow.

Mr. Berkhous: My fish fed up until the spawning time, when the small mouth died off as high as ten in one day. They were perfectly healthy fish.

Mr. Meehan: We have to look for something else besides age as the cause. If the eggs were properly fertilized and die afterwards then it must have been something else besides the age of the males.

Digitized by Google

Mr. A. G. Buller: I have noticed that in some bass nests, when examined in the morning and in the afternoon would show no bad eggs, but the next day there would be a few. Would eggs dying the next day have been properly fertilized?

Mr. Meehan: If bass eggs appeared good for two or three days it would naturally be thought they were properly fertilized.

Mr. Safford: By going over the nest I can tell whether the eggs are properly fertilized. They have a more brilliant lustre. One of two things it must be, either the ponds are too shallow or they advance too rapidly.

Mr. Meehan: Mr. Safford, how is the water temperature?

Mr. Safford: Was not within the danger period at any time.

Mr. Haas: The 10th day of May I had bass.

Mr. Meehan: Mr. Buller, about your spawning water, your spawning area is about two feet?

Mr. A. G. Buller: About two or two and a half feet. Practically the same depth.

Mr. Berkhous: About the same depth.

Mr. A. G. Buller: The fish may be perfectly healthy looking yet not in a healthy condition and the effect would show in the eggs.

Mr. Safford: I cannot see why then we should get even three nests.

Mr. Meehan: The very fact that you did get three or four nests would rather indicate there was something wrong with the fish themselves. They could have every appearance of health and yet have something wrong with them, but I do not believe it is due to age. How did you feed them, Mr. Safford?

Mr. Safford: I cut liver in strips, but they did not take it.

Mr. Meehan: How about feeding yours, Nathan?

Mr. N. R. Buller: I never had any trouble to feed.

Mr. Meehan: Mr. Wm. Buller, you had some bass in your ponds at Corry, did you have any trouble with them taking artificial food?

Mr. Wm. Buller: Not a very great deal.

Mr. Meehan: Did you when you started?

Mr. Wm. Buller: I just fed them lungs. Never any liver. The same as trout.

Mr. A. G. Buller: My yearling bass will take lungs, but I think that is due to the minnows going up and feeding that start the yearling bass to take the food. My bass pond is half as large as Mr. Safford's and I do not think I should have more than seventy-five bass in my pond; they should not be crowded. I think that Mr. Safford has too many bass in his pond. My pond is 200 feet long and contains 2,000 square feet. Mr. Safford's is 16,000 square feet. Two years ago I lost a quantity of bass. In the fall of the year I had about one hundred and

Digitized by Google

forty nice fish. In the spring, when the ice went off, the bass were healthy and plump, but began dying. I took out of that pond 75. What was the cause of that? I did not lose any this spring, so do not think it a good thing to crowd the bass in the ponds.

Mr. Meehan: Mr. Lydell, of Michigan, is a man who has observed very closely and he is in favor of a small number of fish in ponds. Better results are obtained by reducing the number down to a certain point. You get better eggs and more fish, according to him.

Mr. N. R. Buller: I have about two hundred and twenty-five fish in mine and the pond is nearly double that of Mr. A. G. Buller's. The kettle of my pond is very large. The large part of the kettle is 60 feet. The volume of my water is three-fourths more than Mr. A. G. Buller's.

Mr. A. G. Buller: I think if Mr. Safford's kettle of his bass pond was larger it would be better.

Mr. Meehan: It was deemed desirable to make the bass pond at the Crawford Hatchery the way we did, but I also believe a larger kettle would be better.

Mr. A. G. Buller: I believe if we built the ponds alike at every station the results would not be the same. Conditions vary in different localities.

Mr. Meehan: Each man has pursued his own methods. Different kinds of water have to have different kinds of ponds.

Adjourned.

The facts developed by the meeting were, first, contrary to popular impression even among fish culturists, it is not necessary that the Lydell or any type of box be so set on a nest that the fish thereon is screened from the observation of fish on another nest.

Second, that, contrary to usual belief, it is not necessary that black bass artificial nests be set at any considerable distance apart or even at regular distances apart.

Third, that while a natural nest may sometimes have more eggs than one constructed by the fish culturist it is not necessarily the case.

Fourth, that while black bass prefer and usually built their nests in three feet of water or less they sometimes will spawn in water six or seven feet deep and even at a greater depth.

Fifth, that it is important to frequently and liberally feed the brood fish regularly until they begin to spawn. That overfeeding is very apt to produce unfertile milt and perhaps eggs which cannot be fertilized.

The following points previously accepted by fish culturists were confirmed as a result of the meeting above reported stenographically: First, that better results are obtained from a few fish in a pond than from a considerable number.

Second, that black bass will frequently refuse to occupy an artificial nest even when well constructed, and build a natural nest for itself.

Third, that black bass can be made to take artificial food.

Digitized by Google

Meeting at Erie Auxiliary.

As a further example of the value of the gatherings, the following meeting of the Superintendents held at Union City on the date preceding the one at Conneaut Lake:

Mr. Meehan: We have at Spruce creek a new station and we are rapidly building a large trout plant there. We have a spring which yields about two thousand gallons of water a minute. We have that spring at present split into three parts. We run one split, a ten-inch pipe, into the hatching house. A second split would fill about a six-inch pipe and flows into a set of ten fry ponds in one string, one below the other. The third split is in a series of six or seven or eight ponds, varying in length from fifty to seventy-five feet and from twenty to twenty-four feet wide. The fry ponds in the second split are about thirty feet long and about twelve or fourteen feet wide. Those ponds are all about three feet deep, excepting the big pond, which is about four feet deep. Now at the present time we are running all the water from the spring in these three splits with the idea of bringing them together further down at some future time. The question is, can one more split be made for a third series of ponds? The third series of splits is for yearlings and three-year-olds, and the fourth, if it is made, will be for two-year-olds or thereabouts. The water temperature of the spring is 52. The water itself is about the same character as at the Allentown hatchery, that is, it is nearly soft. There is a little bit of lime, but not a great deal. It is so little that one can make soap suds with it. What is your opinion, Mr. Nathan Buller: can that fourth split be made?

Mr. N. R. Buller: I certainly think you can with that quantity of water.

Mr. Meehan: The water of the first split, after it runs through the hatching house, will flow out and enter a set of ponds extending down along the hillside for say a thousand feet. The second split flows from the spring into the set of fry ponds that extend for about two hundred and seventy-five feet to the lower end of the hatching house, where it empties into the set of ponds that I have just described. The third split flows through the ponds parallel to the first two hundred and seventy-five feet and then turn along the front of the lower end of the hatching house, and again through ponds parallel with those along the hillside about five hundred feet, where it enters the first set of ponds. This fourth set of ponds, if it is deemed safe to build them, will extend about two hundred feet westward of the second row, and then turn and extend eastward eighty feet and then through two ponds and empty into the second tier of ponds. You think that can be done?

Mr. N. R. Buller: If you are not running more than five hundred gallons in one section it would take about a six-inch pipe and the temperature of the water is not over 54.

Mr. Creveling: I think that if you want to stock your ponds pretty full of fish you will have trouble. You would have the two six-inch pipe and run into three, whether your temperature goes down much or not.

Digitized by Google

Mr. Meehan: We have the same kind of water as at Allentown. You feed four ponds with a six-inch pipe. One feeds ten now and another feeds six at the present time.

Mr. Creveling: You cannot carry as many fish in lime water as you can in moutain water. We have four pipes and I used three and within three days I had to give them an extra pipe. They are one-inch pipe.

Mr. Meehan: Could you not take a little water from the other ponds to give sufficient to make that other split?

Mr. Creveling: They are running more than half the water now. What is the difference in pond area at the hatchery leaving out those eight ponds and the ponds that used to be at Allentown?

Mr. Mehan: Including the big pond pretty near what it was at the old hatchery.

Mr. N. R. Buller: Then I think a little could be taken from the other ponds.

Mr. H. M. Buller: I am running through each fry at the upper end of my hatchery two two and a half inch pipes.

Mr. Creveling: You are running creek water?

Mr. H. M. Buller: Yes.

Mr. Creveling: What is the temperature of that water?

Mr. H. M. Buller: Fifty-two and fifty-four degrees, excepting in the middle of summer, when it is higher without causing the fish any distress.

Mr. Creveling: What is the area of the ponds?

Mr. H. M. Buller: About fourteen by forty feet.

Mr. Creveling runs one-inch pipe, four to each pond. There is no pressure from my pipes as there is a fall of only about four inches and each pond contains about ten thousand fish.

Mr. Meehan: Your opinion is that you could not spare any water?

Mr. W. H. Haas: We could not run that with my spring. I could not believe we could split for another series in Spruce Creek. I would be afraid of it.

Mr. Meehan: Mr. Safford, you were in trout work. You have heard what has been said here. What is your opinion as to the possibility of another split at Spruce Creek?

Mr. Safford: I think it can be done.

Mr. Meehan: What is your opinion as to taking a little water from each series of ponds?

Mr. Safford: I could not express an opinion because I have never seen it and do not know how much pressure is behind it.

Mr. Meehan: I should say that the pitch behind was the same as at Bellefonte.

Digitized by Google

Mr. Safford: Then I think it can be done.

Mr. H. M. Buller: How is the pitch compared with Allentown?

Mr. Meehan: There is more water at Spruce Creek than at Allentown and about the same fall. Mr. N. R. Buller, you have seen both stations, is not the fall about the same?

Mr. N. R. Buller: I should judge by what I have observed that the fall at Spruce Creek is at least equal to the fall at Allentown.

Mr. Hartman: What is the fall from the spring to the lower end of the hatching house?

Mr. Haas: Four and a half feet.

Mr. Meehan: What is your fall, Mr. Creveling?

Mr. Creveling: I could not tell you certainly. I guess about thirty inches with about a five-foot drop from spring to pond.

Mr. Meehan: That would be a little over four feet.

Mr. Creveling: Just about the same pitch as Spruce Creek—12-foot drop on one and five on the other.

Mr. Safford: I do not think there would be any question but that you could make the split.

Mr. Meehan: It seems to me, from what they all say, that it would be perfectly safe to make that fourth split and that another would be worth trying over at Allentown. Mr. N. R. Buller has four splits on two hundred gallons and that four splits is split into six. Water temperature, 58 degrees. Fish do nicely in that water.

Mr. Meehan: Is there any other point that would suggest itself in regard to the trout work that we would like to take up?

Mr. N. R. Buller: What is the cause of short gill covers? I have the least number of trout of any of the trout hatcheries, but I have as many short gill covers as anybody proportionately. I have never caught a wild trout with short-gill covers.

Major Evans never caught a wild trout with short-gill covers.

Mr. Whitaker never did.

Mr. H. M. Buller never did.

Mr. A. G. Buller has.

Mr. Meehan: Where were you fishing?

Mr. A. G. Buller: Down those streams from the hatchery.

Digitized by Google

Mr. Meehan: Could they have been fish that were planted?

Mr. A. G. Buller: Yes, maybe, but they have been caught out in the streams and I don't see how they could have got out from the hatchery. I have seen No. 1 fingerlings with evidence of short-gill covers right in the troughs.

Mr. Meehan saw more at Weissport than any other place.

Mr. Safford has seen them on every hatchery he ever visited.

Mr. Creveling says it is done in the fry stage—in the first six or eight weeks after the fish are in the house.

Mr. N. R. Buller says: You take your fry that gets into your outlet, you never find them with short-gill covers, but right up in your troughs. In the old days over in the Allentown hatchery, when we run 15 to 18,000 to a trough, there were many then.

Mr. Safford suggests to experiment on two troughs, counting the fish.

Mr. Berkhous: You find a lot of them at Penn Forest and their ponds were not overcrowded, but I thought it was due to the filthiness of the water. Some ponds did not have over fifty fish in them.

Mr. Hartman: When did you find this—after they began to feed?

Mr. Berkhous: We noticed it in the advanced fry stage.

Mr. Creveling: Why does it not come from handling them—picking them up in the scap net? It may be done in the handling.

Mr. Meehan: Mr. N. R. Buller, do you find any perch with short gill covers?

Mr. N. R. Buller: Yes, lots of them. If you would handle trout and handle them rough enough to knock off the gill covers you would have a dead trout.

Mr. Hartman: I find many perch in Lake Erie with short gill covers. It might be done in the scap net in the early stages of growth.

Mr. Creveling's idea is that short gill covers are chiefly due to overcrowding the troughs.

Unanimously agreed that this is the probable cause.

Mr. Meehan: Another interesting little thing which none of our hatcheries have and I did not see in Mr. Creveling's hatchery, is the throat tumor or goitre. I have seen it in Weissport to some extent and at Blooming Grove and at Penn Forest, and invariably the ponds have been filthy ponds. Wherever the ponds were the filthiest there throat tumor has been the most abundant. I have never found it where the ponds are clean. My idea is that that disease is largely due to filthy ponds.

Digitized by Google

Mr. Creveling: I always thought it was caused by feeding. If the food is not scattered the fish make a dive and strike each other. They can bite a piece out of a trout and it heals up, but a bruise is different.

Mr. Haas says the food should be scattered all it can.

Mr. N. R. Buller thinks it starts from an injury and develops in filthy ponds.

Mr. A. G. Buller: At Port Allegany I found the ponds in pretty bad shape and I found the same thing on the fish at Port Allegany. The ponds were not overcrowded and the food is scattered.

Mr. Meehan: I found the ponds at Blooming Grove in a very filthy condition; in fact, I don't know if they are ever cleaned out.

Mr. H. M. Buller: Found in one of my ponds of silver side salmon a lot with boils. It was found in the lower pond and they were crowded. Thinned them out and the trouble disappeared. There was more dirt in that pond than in the upper. They are one year old now.

The facts developed at this meeting were: First, that it is dangerous to spread or divide the water of a spring into many parts; that the exercise of the greatest judgment should be used in the matter. Second, that water can still be spread into a greater number of parts than was believed a few years ago. Third, that short-gill covers in fish is probably produced by handling in the hatchery troughs.

Digitized by Google

REPORTS OF HATCHERY STATIONS.

CORRY HATCHERY, NO. 1.

Report of William Buller, Superintendent.

Hon. W. E. Meehan, Commissioner of Fisheries:—

Sir: In my last report I stated that there were 4,000,000 brook trout eggs and fry in the hatchery troughs. From these I was able to distribute 3,969,500 fish in twenty-three different counties. The fry were in a healthy condition. On account of the open winter of 1909 we were able to begin distributing the fish earlier than usual, and they were carried without the use of ice. I wish I could be able to ship all my fish without using any ice, as I feel the results would be better.

This year there were 1,800 large male brook trout distributed to the following counties: Crawford, Clinton, Erie, Venango and Warren.

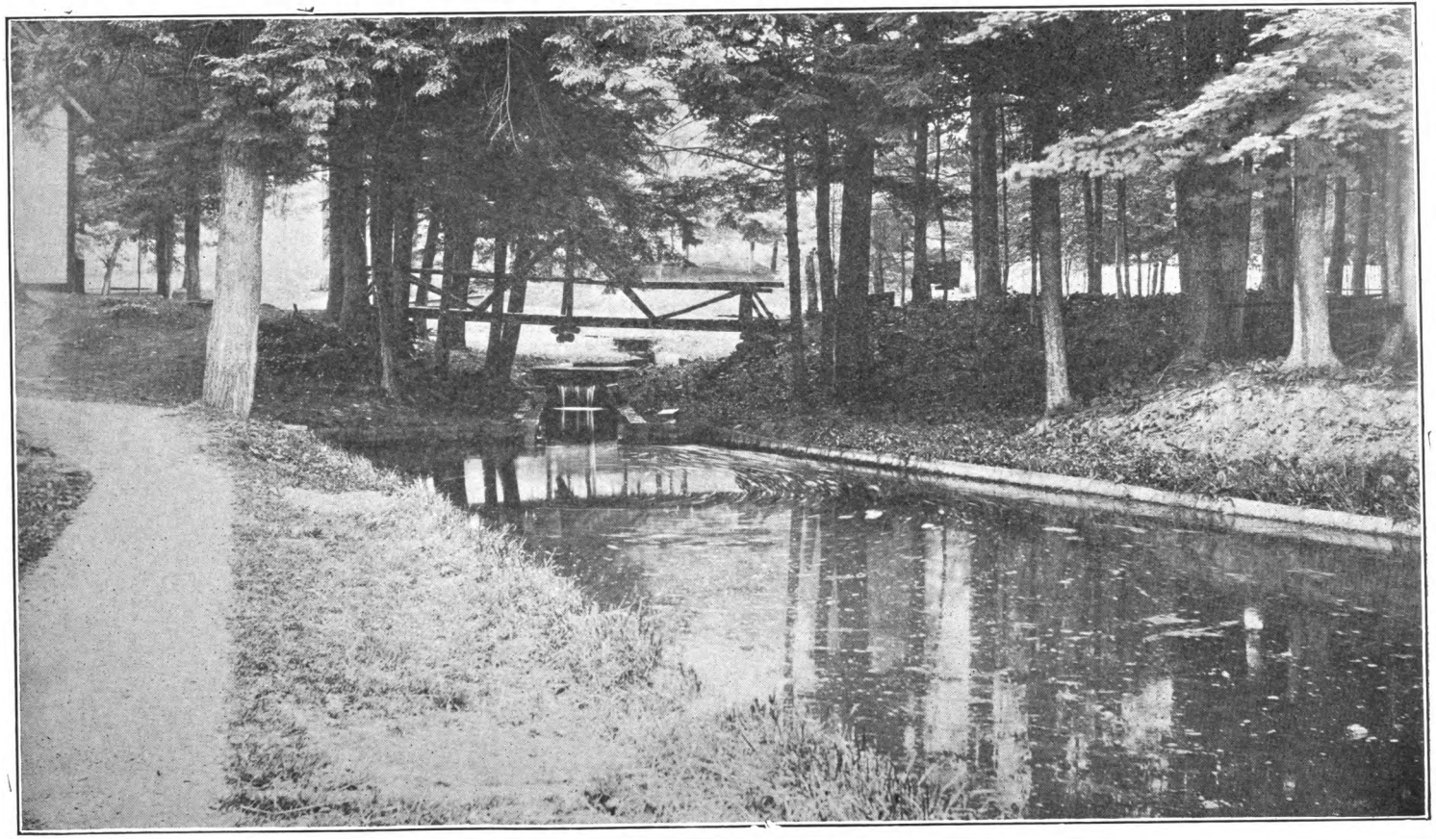
The brown trout were distributed to Blair, Centre, Cambria, Elk and Warren.

During the month of December I received 1,000,000 lake trout eggs from the Union City hatchery. During May I planted the fish, fingerlings No. 1, hatched from these eggs in Lake Erie. As I mentioned in my previous report I had made a cross between the European brown and brook trout, but I have not as yet been able to find ripe males or females. They are now about four years old.

The improvements made on the grounds at the Corry hatchery from time to time are beginning to show for themselves and are daily adding to the appearance of the place. The rebuilding of the entire number of ponds with concrete and tile blocks has been nearly completed. This also affords better satisfaction in handling the fish.

During the summer we built two new ponds about 40 x 60 feet to carry fry and yearlings. On the acre of ground recently purchased I am building a large pond to carry adult trout. This pond covers over one-fourth of an acre. The sides are built of concrete same as the ponds I have mentioned. The depth of the water at the deepest point will be about five feet. I expect to carry a large number of breeders in this pond and look for good results. This pond will be supplied from springs we have been unable to utilize heretofore. We graded around the new ponds and replaced some of the old wooden trunks with six-inch sewer tile, using altogether one hundred feet. Built a concrete sill under No. 1 hatching house, also concrete floor, step and platform in meat house. Painted No. 1 and No. 2 hatching houses, office building, and posts of wire fence which enclose the grounds. Also painted the Superintendent's dwelling house, woodshed, and laid four-inch drain tile from cellar.

Digitized by Google



A View of Corry Fish Hatchery.

Digitized by Google

Digitized by Google

The Corry Fair Association were desirous of having a live fish exhibit at the Fair this year, but the matter was not considered in time to properly arrange the exhibit; however, I placed my large goldfish aquarium in one of the buildings and secured several fine specimens of goldfish from Bellefonte and Torresdale hatcheries. This display was quite an attractive one. Since then the officers of the Association having learned that you are interested in having the fish displayed in this way, and also being pleased with the success of the exhibit this year, have decided to build a place for an attractive fish exhibit for the coming summer.

At the present time I have 4,700,000 brook trout eggs, 100,000 brown trout eggs from my own fish and 800,000 brook trout eggs received from the Paradise Brook Trout Hatchery.

Estimated number of fish in ponds at the hatchery for breeding:

Brook trout, four year old and over,	19,000
Brook trout, three year old and over,	9,300
Brook trout, two year old and over,	45,000
Brook trout, one year old and over,	60,000
Lake trout, five year old and over,	400
Lake trout, four year old and over,	800
Rainbow trout, four year old and over,	1,500
Rainbow trout, three year old and over,	1,500
Sunfish,	300
Catfish,	180
Bullheads,	40
Goldfish,	74
Total,	138,094

The distribution of fish from this hatchery by counties follows.

Trusting this report will meet with your approval.

Respectfully yours,

WILLIAM BULLER.

Fish, Etc., Distributed from December 1, 1908, to November 30, 1909.

Brook Trout, Fingerlings No. 1.

Armstrong county,	9,000
Bradford county,	6,000
Butler county,	16,000
Clarion county,	126,000
Crawford county,	66,000
Clinton county,	394,000
Cameron county,	116,000
Centre county,	108,000
Clearfield county,	301,000

Digitized by Google

Erie county,	345,500
Elk county,	335,500
Forest county,	216,000
Huntingdon county,	65,000
Indiana county,	4,000
Jefferson county,	84,500
Lycoming county,	201,000
McKean county,	284,500
Mercer county,	12,000
Potter county,	497,000
Sullivan county,	108,000
Tioga county,	243,000
Venango county,	59,500
Warren county,	371,000
Total,	3,968,500

Brown Trout.

Blair county,	12,000
Cambria county,	3,000
Centre county,	4,000
Elk county,	25,500
Warren county,	2,000
Total,	46,500

Lake Trout, Fingerlings No. 1.

Erie county,	700,000

Large Brook Trout Males.

Crawford county,	200
Clinton county,	300
Erie county,	900
Venango county,	300
Warren county,	100
Total,	1,800

Catfish, Fingerlings No. 2.

Crawford county,	300
Clearfield county,	900
Erie county,	500
Elk county,	600
Warren county,	2,800
Total,	5,100

Digitized by Google

Blue Gill Sunfish, Fingerlings No. 1.

Crawford county,	5,000
Warren county,	5,000
Total,	10,000

Summary.

Brook trout, fingerlings No. 1,	3,968,500
Brown trout,	46,500
Lake trout, fingerlings No. 1,	700,000
Large brook trout, males,	1,800
Catfish, fingerlings No. 2,	5,100
Blue gill sunfish, fingerlings No. 1,	10,000
Total,	4,731,900

Digitized by Google

ERIE HATCHERY, STATION NO. 2.

Report of Philip H. Hartman, Superintendent.

Hon. W. E. Meehan, Commissioner of Fisheries:—

Sir: I herewith submit to you my fourth annual report from December 1, 1908, to November 30, 1909. I regret to say that the output for the last year was a trifle below that of the previous year. The decrease was not due to the quantity of eggs taken, for we had more eggs than ever before, but was due to certain portions of shipments of white fish and pike-perch eggs not being up to their usual standard. This, for the most part, was due to severe storms prevailing at the spawning periods of these two fishes. The total output was 244,166,245 fish, fry and frogs. The number of each kind and distribution of same will be found in table of output hereto attached. The last herring eggs were taken December 5, 1908. The reason for ceasing operations at this time was that the weather was very bad, fishermen being unable to reach their nets for days at a time. Naturally, after such delays between lifts very few live fish were to be found in the nets.

About December 1, 1908, reports reached here that large hauls of white fish were being made at Port Maitland, Ontario, and that millions of eggs were to be had if there was some one to take them. December 5th I decided it was worth the effort to make a trial. The Commodore Perry, with spawners, was ordered to Port Maitland. On arrival there it was found we were just about fifteen days too late as the fishing was just over. According to information received from the fishermen at Port Maitland there must have been many millions of eggs destroyed, or, in other words, wasted annually. So a partial agreement was made at that time whereby we were to have the eggs another year for the taking. But along in August following, I received word from Commissioner Meehan, saying that he had received official notice from the Canadian Fishery authorities that there would be no fishing for white fish in the spawning season. This was not very encouraging news as I had been planning for a heavy take of eggs from the Canadian shore. I then let the matter rest for the time being. In October word came to me unofficially that the fisheries authorities had decided to let the fishermen fish in the spawning season.

Acting accordingly, I ordered Captain Driscoll to clear for Port Maitland October 21st, instructing him to get all information available, and make all possible arrangements to get the eggs. On his return the Captain reported that the officials from Windsor, Ontario, had been to see Port Maitland fishermen and notified them that they would gather the spawn for their hatcheries. Before leaving Captain Driscoll was informed that there was a fishery at Nanticoke, Ontario, nine miles from Port Dover, operated by Mr. A. B. Hoover and that heavy catches of white fish were made at his fishery. Furthermore

Digitized by Google

the information was positive that we would be able to take a great many eggs.. October 27th, acting under instructions, Captain Driscoll sailed for Port Dover. On arrival there he got into communication with Mr. Hoover and stated to him just what was wanted. Mr. Hoover readily consented to let us have the spawn. So November 3d the Commodore Perry with spawn-takers, egg cans, etc., cleared for Port Dover and Nanticoke. From November 4th to December 1st there were taken at the Nanticoke Fishery of Mr. A. B. Hoover, 41,760,000, white fish eggs, and barring accidents and other unforseen obstacles that might get in the way, we expect to double the take from the Canadian shore another year.

Had it not been for the Canadian white fish eggs this hatchery would hatch very few white fish fry this coming spring owing to the very poor quality of eggs received from the field at Port Clinton, Ohio. I can safely say that if the Canadian eggs had not reached this shore this hatchery would be without a white fish egg, with the exception of a few million taken at Erie, mostly from penned fish. Had it not been for this new work introduced a few years back, and known as field work, the eggs we now have in incubation would have gone to waste. I wish to state here that Mr. Hoover was very hospitable to the spawners and boarded them free of charge, and he himself took a large number of eggs.

Mr. Charles Klingbiel, Assistant of the Torresdale Hatchery, was in charge, having as his assistant, Philip Hartman. Mr. Klingbiel is, no doubt, one of the best white fish spawners along the lakes, and Mr. Hoover has partly exacted a promise for the return of these two men another year.

November 8th we started to pen white fish in Presque Isle Bay in specially prepared cribs for holding to spawn. We began searching them November 12th and up to December 9th, 2,016,000 eggs were taken in this way, but on the 9th we were forced to pull the cribs out owing to heavy ice beginning to form about them making it a dangerous risk to have them in longer. At the time we still had 500 unspawned fish in the nets, the loss of which would have meant quite a loss in money to the Department as we were responsible for any and all fish lost.

The take of herring eggs this fall was the largest in the history of the Department. A total of 165,438,000 eggs were taken from November 23 to December 7. Twenty-three million nine hundred and thirty-seven thousand of the above were taken at Port Stanley, Ontario. The balance of 141,501,000 were taken from the field at Erie. Owing to the Commodore Perry being busily engaged transporting eggs from Port Dover, transportation was asked for men and cases of eggs of the Bessemer and Marquette officials, which they kindly and gladly gave. By these means the eggs were transported by water from Port Stanley, Ontario, to Conneaut Harbor, Ohio, and thence twenty miles by rail to Erie. As I was busy at that time with the white fish and herring field at Erie, in addition to caring for all eggs taken, I was forced to call Mr. W. H. Safford, Superintendent of the Crawford Hatchery, to assist me, he taking charge of the field at Port Stanley.

April 14th the first shipment of pike-perch eggs arrived from Toledo and the last shipment on the 29th. Certain portions of most every shipment were very bad eggs, making the percentage of hatch drop

Digitized by Google

considerably below the average. Of these eggs Crawford and Union City Hatcheries received what we term green eggs. To Pleasant Mount and Torresdale Hatcheries eyed eggs were supplied. All pike-perch hatched at this station the past year were planted in Presque Isle Bay and Lake Erie, none being shipped to interior waters whatever.

May 8 we started to take blue-pike eggs. To May 23, 116,110,000 eggs were taken. Many more could have been taken, but the appropriation for field work became exhausted about this time, therefore we had to cease operations. The blue-pike began to hatch May 20th and the last of them hatched June 6th. One large shipment of fry was made to Millersburg and planted in the Susquehanna river.

There were only 1,045,000 yellow perch fry hatched here the past year. Formerly large quantities of these eggs were furnished this hatchery from the perch fields in Wayne county, and on other occasions from some of the other hatcheries, but none came from this source the past year. I am in hopes that I may be able to devise some way of gathering enough from Lake Erie this coming spring for this hatchery at least.

Thirty thousand frogs and tadpoles, of the leopard species, were propagated here. All were used for food for adult fish that we had in keeping at all times through the summer, so there were none for distribution. One large shipment of bullfrogs was received from the Wayne Hatchery and planted in ponds on the Peninsula.

The fore part of November the Commissioner of Fisheries forwarded to the Erie Hatchery a permit from the New York Fish and Game Commission, authorizing Captain William Tallman, owner of the tug "Rocket," to fish for lake trout in New York waters for the gathering of spawn. Captain Tallman set out for the trout the last week in November. He got three lifts, but the entire catch for these lifts was only 1,460 pounds. The number of eggs taken was 129,600. As the lake trout run very large and are hard to handle, and as more care must be exercised in taking these eggs, Mr. Charles H. Nesley, one of the Department's expert spawners, was assigned to this particular duty. As the lifts for trout were few Mr. Nesley rendered good service in the way of taking herring spawn and at various times gave his assistance at the hatchery when needed.

The planting of fry this spring for the first time was done by the Department of Fisheries' own tug, "Commodore Perry," the boat being put in commission March 12th for this duty. In addition to fry planted from this station many shipments of white fish, herring and trout were shipped in from Corry and Union City Hatcheries for Lake Erie. The fry were all more carefully planted and scattered over a larger area, so with more care in planting there is reason to believe that still better results should be derived from it in the future.

Several of the hatcheries were in need of more brood fish, mostly blue gills and calico bass, so in the fore part of June the seine was drawn for them, but we were unable to get them in any large numbers, not more than 200 being taken in two weeks of continuous seining.

Adult yellow perch and small mouth bass were collected from pound nets. Work was started early in the summer and continued until late in the fall. All fish taken in this way were sent mostly to Crawford Hatchery, a few going to Union City.

Digitized by Google

I also gathered some very fine specimens of various types and species of fish for the Pennsylvania State Museum. There are many varieties still to be looked up and forwarded. As nothing but the finest specimens are taken for this work it will take fully two years or more to get them all.

While inspecting the hatchery in June the Commissioner at the same time looked over the properties adjoining this hatchery, one piece on Sassafras street, the other on Second street. Before leaving he decided on having the house and lot on Second street and forthwith authorized Hon. John Hamberger, Resident Commissioner, to purchase same, which was done shortly after. The Commissioner instructed me to put the house in condition and make such repairs as were necessary. I found the interior in very bad condition (the least said the better). I had some of the plaster torn out and repaired, repapered every room, and painted all interior woodwork, moved the dividing line fence, and built it so as to have both properties in one yard. I moved into the dwelling in September and find it very convenient to be so near the hatchery as I can now be in the hatchery at a moment's notice at any hour of the night. The calls at night are frequent, especially so in hatching seasons and at spawn taking seasons.

The old storage tank on the second floor of the hatchery was torn out the past summer and the water supply piped direct to the batteries. Owing to the high pressure it was believed in the past that it was impracticable to run the water direct into the batteries, as the belief was that there would be so much air in the water that it would blow all the eggs out of the jars. I am pleased to say that the jars are operated just the same as ever, and the water supply is regulated much easier and quicker than the old way; furthermore, the upper floor of the hatchery is relieved of nine tons' weight of water.

I here again call attention to the hatchery building. It is very unsafe, as the second floor is in very bad shape and one is in danger of breaking through at any time. I would not think of using it, but our room is very limited, especially our storage capacity, therefore we must use it. The building itself is now beginning to spread at the base. Generally speaking, the whole building, were it new, is far too small for the amount of work being done at present, and the work is increasing with rapid strides each year.

Thanking the Commissioner of Fisheries, Hon. W. E. Meehan, and all connected with the Department for the hearty support accorded me the past year, also hoping this will meet with your approval, I remain,

Yours very respectfully,

P. H. HARTMAN,
Superintendent.

Digitized by Google

FISH, ETC., DISTRIBUTED FROM DECEMBER 1, 1908, TO NOVEMBER 30, 1909.

Adult Fish.

Blue gills,	198
Rock bass,	76
Calico bass,	81
Black bass (small mouth),	186
Yellow perch,	580
Sturgeon,	8
Catfish,	16
Total,	1,145

Erie County, Union City Hatchery.

Sturgeon,	4
Bass (small mouth),	25
Rock bass,	48
Calico bass,	60
Total,	137

Crawford County Hatchery.

Bass (small mouth),	161
Yellow perch,	580
Sturgeon,	4
Catfish,	16
Rock bass,	28
Calico bass,	21
Blue gills,	48
Total,	858

Philadelphia County, Torresdale Hatchery.

Blue gills,	150

Summary of Adult Fish Distributed.

Blue gills,	396
Rock bass,	152
Calico bass,	162
Black bass,	372
Yellow perch,	1,160
Sturgeon,	16
Catfish,	32
Total,	2,290

Digitized by Google

Distribution of Blue-Pike Fry.

Dauphin county,	1,600,000
Erie county, Lake Erie,	98,066,000
Total,	99,666,000

Fry.

White fish,	32,869,700
Herring ,	49,934,400
Pike-perch,	60,620,000
Blue-pike,	99,666,000
Yellow perch,	1,045,000
Frogs, tadpoles,	30,000
Total,	244,165,100

Pike Perch Eggs, Distributed.

Wayne hatchery, eyed eggs,	8,000,000
Torresdale hatchery, eyed eggs,	4,000 000
Union City hatchery, green eggs,	50,225,000
Crawford hatchery, green eggs,	23,450,000
Erie hatchery, green eggs,	151,550,000
Total,	237,225,000

Blue-Pike Eggs Distributed.

Erie hatchery,	166,110,000

Herring Eggs Distributed.

Union City hatchery,	106,353,000
Erie hatchery,	59,085,000
Total,	165,438,000

White Fish Eggs Distributed.

Erie hatchery,	96,516,000

Lake Trout Eggs Distributed.

Union City hatchery,	129,600

Yellow Perch Eggs Distributed.

Erie hatchery,	1,100,000

Digitized by Google

Number and Kinds of Eggs Taken.

Herring eggs taken at Erie,	141,501,000
Herring eggs taken at Port Stanley, Ontario,	23,937,000
Total,	165,438,000
White fish eggs from Nanticoke, Ont.,	41,760,000
White fish eggs from Port Clinton, Ohio, no good,	51,768,000
White fish eggs from pens at Erie,	2,016,000
White fish eggs from nets at Erie,	972,000
Total,	96,516,000
Laketrout eggs,	129,600

Summary of Eggs Distributed.

Herring eggs,	165,438,000
White fish eggs,	96,516,000
Lake trout eggs,	129,600
Blue-pike eggs,	166,110,000
Pike-perch eggs,	237,225,000
Yellow perch eggs,	1,100,000
Total,	666,518,600

Digitized by Google

BELLEFONTE HATCHERY, STATION NO. 3.

Report of Howard M. Buller, Superintendent, and Harry I. Griffith, Assistant Superintendent.

Hon. W. E. MEEHAN,
Commissioner of Fisheries, Harrisburg, Pa.

Sir: Please find herewith my report in connection with that of the Assistant Superintendent, Mr. Harry I. Griffith, for the year beginning December 1, 1908, and ending November 30, 1909. The total output from the hatchery during the year was 3,618,332, separated as follows:

Brook trout, all sizes,	3,551,600
Rainbow trout,	42,050
Goldfish,	182
Catfish,	24,500

For the first time in the history of this hatchery all the eggs from which were produced this year's hatch were taken from the fish in our own ponds. In former years, in addition to our own eggs, we had eggs from Allentown, Weisport or Penn Forest, the last two commercial hatcheries. In making our records we had estimated about three million eggs from our own fish, but later developments showed that it was under the actual amount. Instead of three millions there were about 3,600,000, giving us an output of 3,551,600 fish. The majority of the eggs were from twenty months' fish and they were just as good as the eggs taken from three year old fish and over. At least we obtained just as good results.

We have been very fortunate in this year's hatch with our eggs, eggs hatching in good percentage and the fish are doing well without any disease of any kind. We have no trouble whatever with the fish; there were no signs of the gill trouble which was in the nature of an inflammation. Our fish doing very nicely we were able to put out a fine lot of fingerlings. Applicants throughout the entire district sent letters expressing their pleasure at the fine appearance of the trout saying that they were the best that had ever been seen from any hatchery.

Having only the one house with 80 troughs we found that we were crowded and had to make some arrangements for thinning the fish. As we had a number of troughs outside we transferred them to the east side of the hatching house and tapped the water from the supply trough in the hatchery, which gave us clear water for the advanced fry. The troughs which before had been on the east side were supplied with water from the creek. Every time that there was any rain or high water the creek would become muddy and there would be a heavy deposit of sediment in the troughs and the water itself would be very muddy.

Digitized by Google

Neither the muddy bottom nor the cloudy water were good for the little fish, at least to the extent which they had it. They could not see to feed properly and the perpetual mud helped to produce inflamed gills. It was partly the moving of the troughs from the west side to the east side and supplying with spring water that I believe was due to our having entire absence of any trouble with the young fish. The spring water was also warmer than the creek water and this assisted in a more rapid growth of the fish. The spring water being clear also enabled the fish to get all the food that was given them and that aided in increased size. On account of this quicker and equally heavy growth we were able to begin shipping at least two weeks earlier than in previous years.

At the meeting of the Superintendents held in the Commissioner's office at Harrisburg on the 27th of January, the Commissioner directed us to retain about 200,000 fish for brood purposes. We set aside that number but from one cause or another, which we could not control, we are sorry to say that the percentage of loss was exceedingly heavy, very much more than normal.

The bulk of the fingerlings we put in ponds Nos. 2 to 14 inclusive, but having still more to retain we were forced to use two of the nursery ponds on the east side of the hatching house. These ponds have never been very good for rearing young fish, sometimes they would do fairly well, but as a rule despite every effort the death rate was very heavy. We thought possibly that the poor success was due to excessive widths of the nursery ponds for such small fish together with the small depth of water which could be put in. We therefore divided one of those nursery ponds into two parts and it was in these that we placed the remaining fingerlings. It was soon apparent that the division of the pond did not do away with the difficulty. The little fish did not do better than in previous years. They died off by the hundreds and before many weeks we had practically lost all that were in the two ponds, which amounted to about 20,000.

Ponds Nos. 1 to 13 had been built about three years before by contract and while the contractors had apparently complied with all the specifications and had done their work conscientiously, the work was new to the contractors and there were mistakes made. One of the results of the mistakes was in the spring, when the ends of two of the lower ponds gave way and about 25,000 fingerlings escaped into the sluice and stream. Subsequently we recovered about 3,000. These two caused a clear loss of over 40,000 fish, probably nearer 50,000, reducing out stock of fingerlings to about 150,000.

On account of pressure of work the usual sorting of fish in the summer was not made and this caused a further and very heavy loss through cannibalism, so that our brood stock of yearling fish is only about 40,000. Of course there was the usual death rate, but the death rate in ponds from two to 14 was only normal. It is very difficult to follow the fish closely. In most of the ponds of the hatchery, owing to the fact that the water supplying them is from the creek, it is exceedingly rare that this water is ever perfectly clear. It ranges from a faint cloudiness to almost muddy to a point where you can see a foot under the water to where you cannot see more than about an inch, but net examination throughout the year showed good health.

Digitized by Google

While this water is cloudy almost all the time, trout when they reach feeding age seem to do well in it, much better in fact than in the water which flows from the spring and which is perfectly clear. The cloudy water appears to act as a mild laxative and contains a great deal of food. Our mature fish also retained fine health throughout the spring and summer and early autumn. There was scarcely any fungus and not a single example of tail disease, and when spawning season came there was not a single example of goitre or throat tumor.

When we came to take the eggs we had trouble with the males. An unusually large percentage had failed to secrete much milt. About 90 per cent. gave less than one-half the amount they should normally. The shortage was so marked that it kept the men who handled the males busy securing enough milt to fertilize the eggs and there were times when they had the greatest difficulty in securing enough. Usually we put the younger men at handling the males, but this year it was necessary to put one of the most expert men at handling the male fish. None of the males developed cheesy milt and it was all apparently perfectly good with full fertilizing power, the only trouble was it scarcity.

This phenomenon was not confined to the trout of any one age, but was equally prevalent among the two year olds, three year olds and four year olds. The only difference that was noted was that when the two year olds were handled the second time they developed about the same quantity of milt as the first handling, but the majority of the males of three year olds and upwards when handled the second time did not give any.

Immediately after the spawning time we had a very heavy and unexpected loss among the fish, the heaviest being among the three year olds and over and confined principally to the males. We believe that much of this loss was due to a necessary temporary overcrowding. Ordinarily there would not have been an overcrowding and there were no more in the same ponds than had been the practice to put there and safely, but owing to the excessive drought there was much less water flowing through than usual. Most of the fish in those ponds died to the number of about 600. This was the only loss that we sustained throughout the year from anything which might be considered as even remotely related to disease.

The females gave a normal supply of eggs and they were of very fine quality, as usual those from the 20 months or two year old fish being as good as those from the older ones. The first eggs were taken on October 9, 50,000 were secured. By the first of December we had taken about 5,000,000 eggs, thus breaking all previous records in the hatchery.

RAINBOW TROUT.

As the rainbow trout work in this hatchery has proven to be unsatisfactory, you directed us to gradually drop it. The rainbow trout in these water spawned about the same time as the brook trout, coming in at the tail end or about the first of December. There is a light demand for the fish and this early ripening causes the utilization of troughs which we could use to better purpose for brook trout. Hence we only hatched less than 50,000 fish and retained only a few fish for breeding, or more particularly in order that we may have a few fish of the species on the place in case of necessity.

Digitized by Google

The rainbow trout on this station are not pure blooded. They are mixed with steel heads, and it is perhaps on account of this hybridization that there are so many barren fish among our brood. About one-fourth of the mature rainbows in our hatchery are barren annually of either eggs or milt.

Last year we had no brown trout and this year we had only two females and one male and we took the eggs from them and fertilized them. There was not enough to make a trough and they were therefor mixed with a trough of brook trout to be retained for breeding purposes in the hatchery.

SILVER SALMON.

The silver salmon on this hatchery are well into their second year and in fine health. They have not made the same growth as they did the first year. This was doubtless due to the fact that we had not time to thin them into other ponds until late in the fall. Last spring there were 13,000 silver salmon by actual count and these were in two ponds up to the period of a year old. They were then from five to six inches long. In the spring when they were one year old they were divided into four ponds. In June they were separated into six, but even this gave too many fish to a single pond. Their average length at the present time is about seven inches, many are six and a number eight. They are very voracious, feed with great eagerness and just as freely as the brook trout. They take food from the surface not only lungs, but insects that fall just as quickly and as naturally as the brook trout.

Their leaping propensities, plainly marked in the first year, is just as pronounced as ever. A two foot leap from the water is not uncommon and at certain times in the day the water in the pond is in turmoil from the number jumping and it is seldom that a minute passes without two or more springing free from the surface. This leaping propensity is so strong that it is hard to keep them within the ponds themselves. They are often found in the race adjoining, and it is fortunate that the race is screened, otherwise there would be a heavy loss through the fish escaping into the creek.

While building a raceway for some new ponds, the foundations of the lower end of one of the ponds holding salmon were undermined and the earth was washed away, allowing all the fish in one pond to escape. Out of 1,500 that escaped, 582 were recovered. The others have made their way into Logan Branch run, and some were afterwards seen a half mile or more below the hatchery. It will be surprising if next spring we do not hear of some strangelly marked brook trout being caught out of Logan Branch.

Above the hatching house there was a pond which is generally known as an ice pond, having been built for the specfic purpose of securing ice. In this pond we had placed a number of catfish and these gave us last summer about 24,500 young fish for distribution. This pond was some of it State property, some on Quarry land and some on land belonging to the Pennsylvania Railroad Company. The pond had been built by a former owner. There were people in the neighborhood who came to look upon gathering ice from this pond

Digitized by Google

as a natural right and not a favor, which we had been in the habit of granting with the permission of the Commissioner. A subordinate of the White Rock Company also assumed propriety rights over the ice and the entire pond. These matters lead to so much unpleasantness that the Commissioner gave orders to tear out that part of the enbankment in the State land, but the Pennsylvania Railroad Company, learning of his decision on the part of the Commissioner, rendered it unnecessary to tear out the enbankment by themselves digging a trench on their side which was the natural outlet.

Mr. B. O. Webster, Assistant Superintendent, handed in his resignation to the Commissioner in January, and he left on February 15 to accept another position in Wisconsin. The Commissioner placed Harry I. Griffith in charge as acting assistant superintendent until the first of June, when he was confirmed permanently to that place.

The spring shipments having been completed, the work of pond construction and repairs was begun. Operations were begun by grading the ground below the hatching house. This was followed by filling in the pond near Shuggart's land, besides grading and sowing grass seed and by planting a lot of willows.

As soon as the new appropriation became available, pond construction was started. There were four ponds left unfinished from the previous year. These were first attended to and then the ends of the two that broke out during the spring were rebuilt and four new ponds constructed. This new pond construction of course included the necessary races and the sewage system. The new ponds are each 50 feet by 20 and with walls four and a half feet, permitting a depth of three and a half feet of water. The raceway is 60 feet long, three feet wide and about four and a half feet deep.

The sewage system prevailing in the large group of ponds, of which these four are a part, were of course continued so that it is possible to draw off the water from any two ponds without disturbing the water in the others, and they can also be cleaned without filth going into other ponds. I think that it is not over much to say that this group of ponds, which now numbers 38, is the finest, most up to date, most conveniently arranged and best adapted ponds for trout, that we have ever seen. When two more ponds are built, the original plans for this group will be completed. The water supply for the entire group comes from Logan Branch run.

The near completion of the group of ponds above described, rendered it necessary to raise the spring or rather the spring walls, and this was done, the walls now being higher by 18 inches. Two years ago we built a number of ponds of this group with a cement which had been recommended highly, but which proved to be very inferior. The walls in many places crumbled and we were compelled to do much repairing last summer, and I feel that hereafter we should always use the particular form of cement which we know to be effective. Furnace slag has been highly recommended for use in concreting, but we have found it inferior to crushed stone, and the four ponds built last summer were of the latter material.

With the four ponds built last summer this hatchery now has 67 ponds, including 11 nursery ponds or fry ponds arranged on the west side of No. 1 hatching house. With the construction of two

Digitized by Google

more ponds to complete the great nest and a large pond by the Dale property, we will have the whole of one section of Bellefonte hatchery completed.

The rapidly increasing annual output last year reached a point where the hatching house was entirely too small to accommodate all the fish. Outside troughs had to be used. The Commissioner authorized and awarded a contract for the building of an additional hatching house. The site selected was on the east side of the old building about eight feet from the building itself. The excavation work was done and the concrete walls and floor built by our own men. A contract for the house and also for an office was awarded to A. M. Karstetter, of Pleasant Gap, for $1,325. The specifications called for a house 100 feet long and 40 feet wide, the same length as the old house, but eight feet wider.

The contractor did his work well and conscientiously and in fact did more than his contract actually called for. The price named did not include the troughs. It was decided to utilize those which had been employed in outside work. They were set in tiers, one row next to the supply trough, two and a half feet from the floor and the lower tier about four inches. By this arrangement the water from one faucet could be utilized in two troughs.

The new house adds to the capacity of the establishment by at least three million fish making it possible for an output of at least 5,500,000 No. 1 fingerlings annually. When all the ponds on the station are filled with brood trout the second house will be insufficient to accommodate the eggs, and it will probably not be more than two or three years before a third hatching house will have to be built.

The office referred to as having been built under the contract will be a great convenience and also enable at least two additional troughs to be put into the old house. Hitherto a space at one end of the building has had to be kept clear for utensils. These can all be kept in the so-called office hereafter. The eight foot space between the two houses has been utilized for a pond which will hold a very large quantity of fish.

The grinding machine in the meat house was operated by a home made undershot zinc wheel. It required a very large amount of water to operate it and even then its work was not satisfactory. During the summer this wheel was replaced by a regularly manufactured undershot wheel. The sprocket, however, we believed to be smaller than it should be to develop the greatest amount of power and a larger sprocket should be put on at the earliest possible date.

The contract was awarded to J. T. Zeigler, of Pleasant Gap, to paint the two hatching houses, the meat house, the Superintendent's dwelling, the stable and the fence along the road in front of the dwelling house to the stable, for the sum of $215. This was the lowest contract out of four bidders, the highest being $455.

THE FISH CAR AND CAR BARN.

The car barn which houses the State fish car was hurriedly built and at the least possible cost when the hatchery was first established. The foundations were improperly built and as a consequence in 1908 when the great flood came, the foundation walls on the east side were all undermined and those on the west side damaged. The building

Digitized by Google

conseqeuntly lurched over and against the car. Had it not been for the presence of the car the entire building would undoubtedly have gone over and been wrecked. The car cannot be taken out of the barn until the barn itself has been pushed back into place and new foundations will have to be built next summer. The car needs repainting and some little interior work done and there should be a new track laid from the terminus of the present track on the north end of the building to the main track of the railroad company, so that when the car is used it will not have to be jacked out of the barn to the track. With the continuous switch the car can be taken out of either end and easily attached to a train whether going north or south.

We have mentioned a shortage of water from the springs on account of the drought. The hatching house supply is from two springs, each having a normal flow of about 200 gallons. About the middle of June a diminishing flow was noticed until about the middle of October the supply from the two springs had been reduced to nearly half. As an abundance of water is necessary in all the ponds, and especially in the hatching house as a precaution, connections were made so as to utilize, if necessary, creek water. A supply trough was extended along the whole length of the west side of No. 1 house and a pipe was connected from the creek supply pipe to the side trough in the No. 2 house. Unless all signs fail we shall be compelled before the winter is over to make use of the creek water in the No. 2 house. The purpose of the supply trough on the west side of the house was to furnish water for the nursery or fry ponds instead of using water from the spring. By employing the side trough we are also able to have a greater depth of water in the nursery ponds through having a greater quantity at our command.

RECOMMENDATIONS.

The entire boundary of the property needs refencing. A new ice house should be built as the one which we now have was originally not built for the purpose and is about falling down. A large trout pond which has been under contemplation for three years should be built this summer for a two fold purpose. First, for the accommodation of large trout, and, secondly, that we may have a place from which to get ice in the winter. This year's ice supply had to be purchased.

As soon as practicable a sewage system should be provided for the nursery ponds at the west side of No. 1 hatching house. At present the water from those ponds flow into a raceway which supplies a set of ponds below and there is no other outlet for the water. When it becomes necessary to clean the nursery ponds all the filth and dirt of necessity flows into the lower ponds. A pipe or sewer line should be extended from the race at the lower extremity of the nursery ponds to the creek, a distance of about 50 feet, so that when the nursery ponds are cleaned the water supply for the lower ponds could be cut off and the filth swept into the stream instead of the ponds. There could be no objection under the law to doing this as the filth itself is not of a character to injure either fish or human life, it being merely the accumulation of mud with some little excrement from the fish.

Digitized by Google

The water from the spring to the No. 1 hatching house is now conveyed by a pipe encased in the east wall of some trout ponds on the south end of the building. I think it would be better for the work if this pipe line were abandoned and the water ran from the spring to the No. 1 hatching house through an open sluice. We believe that there is sufficient fall from the Shuggart spring to allow this to be done although we have not taken the levels.

The work of the hatchery is greatly hampered by lack of suitable artificial light. The buildings are so large that ordinary oil lamps are of very little use and they are besides very undesirable. If some way could be devised to establish a small electric light plant on the property, the work of the hatchery would be greatly facilitated and convenience and comfort to the working force greatly advanced.

Attached to this report will be found the output of fish from this hatchery to the various counties.

Respectfully summitted,

HOWARD M. BULLER,
Superintendent.

HARRY I. GRIFFITH,
Assistant Superintendent.

BELLEFONTE HATCHERY, STATION NO. 3.

Fish, etc., Distributed from December 1, 1908, to November 30, 1909.

Brook Trout, Fingerlings No. 1.

Berks county,	78,000
Blair county,	289,500
Bedford county,	72,000
Bradford county,	7,000
Bucks county,	1,500
Chester county,	138,000
Cumberland county,	159,000
Columbia county,	220,500
Cambria county,	258,000
Centre county,	303,000
Clearfield county,	25,500
Dauphin county,	60,000
Fayette county,	115,500
Franklin county,	108,000
Huntingdon county,	102,000
Indiana county,	24,000
Juniata county,	6,000
Lancaster county,	66,000
Lebanon county,	31,500
Luzerne county,	40,500
Lycoming county,	9,000
Monroe county,	348,000
Montgomery county,	78,000

Digitized by Google

Mifflin county,	73,500
Northumberland county,	106,500
Northampton county,	7,500
Pike county,	30,000
Perry county,	6,000
Philadelphia county,	36,000
Schuylkill county,	169,500
Somerset county,	165,000
Union county,	91,500
Westmoreland county,	84,000
York county,	211,500
Total,	3,521,500

Rainbow Trout, Fingerlings No. 1.

Cambria county,	3,000
Elk county,	10,500
Fayette county	10,500
Schuylkill county,	13,500
Tioga county,	4,500
Total,	42,000

Brook Trout, Fingerlings No. 2.

Cumberland county,	1,250
Centre county,	27,000
Total,	28,250

Brook Trout, Yearlings.

Philadelphia county,	200

Gold Fish, Yearlings.

Blair county,	5
Centre county,	30
Erie county,	47
Philadelphia county,	100
Total,	182

Rainbow Trout, Adults, Male.

Centre county,	50

Digitized by Google

Brook Trout, Adults, Male.

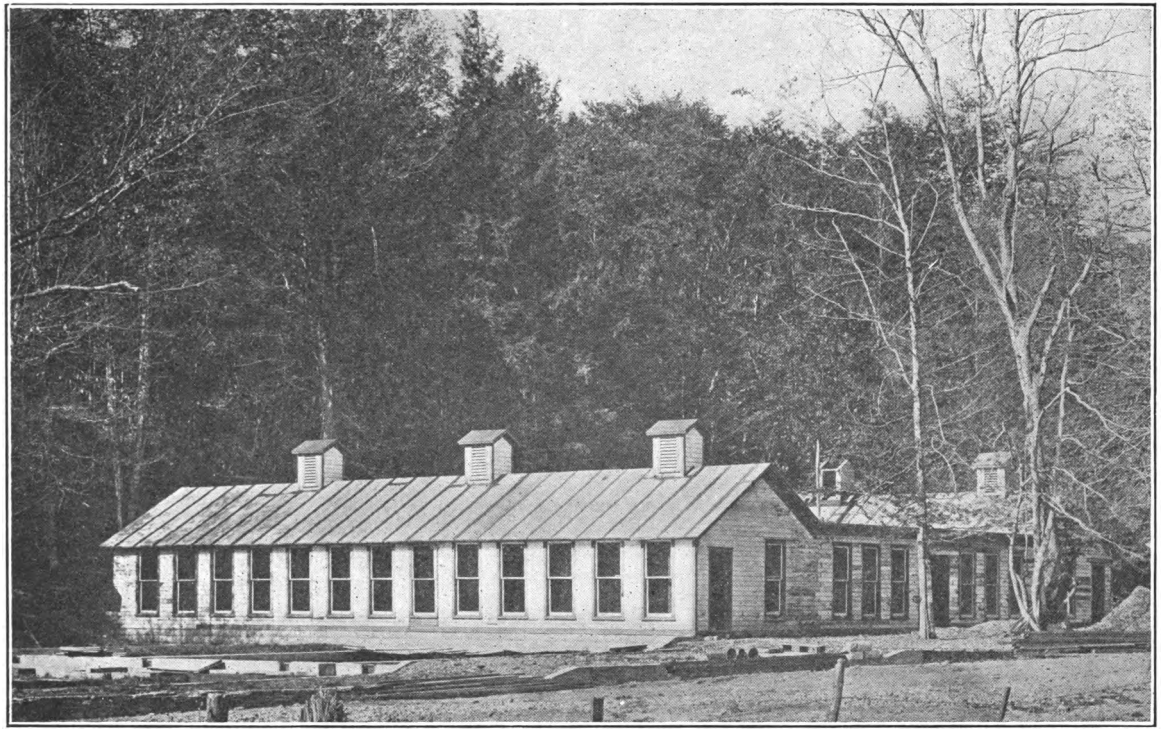
Centre county,	1,450
Dauphin county,	200
Total,	1,650

Catfish, Fingerlings.

Centre county,	14,000
Union county,	10,500
Total,	24,500

Digitized by Google

Digitized by Google



Hatching House at Wayne Station.

Digitized by Google

WAYNE COUNTY FISH HATCHERY, STATION NO. 4.

Report of Nathan R. Buller, Superintendent.

Hon. W. E. Meehan, Commissioner of Fisheries, Harrisburg, Pa.:

Sir: I herewith submit my annual report of the Wayne Fish Hatchery, Station No. 4, from December 1, 1908, to November 30, 1909.

December found me with 1,200,000 brook trout eggs in the hatchery, all taken from the adult trout on the property. The percentage of loss was very small, the eggs hatching gave healthy fish and remained in perfect condition until planted, having no trouble with any disease or fatality whatever.

I have observed that owing to the low temperature of the water it requires a greater length of time to hatch the eggs, about 90 days, and consequently that the fish at the age of three months or when we begin shipping are not more than half the size of the same species of fish reared at the Bellefont, Spruce Creek and Corry hatcheries, and when four months old not more than about one quarter the size of trout of the same age sent out by the United States Bureau of Fisheries sent out from West Virginia, but what they lack in size is fully made up in extra vigor and vitality.

We also had in the breeding ponds a fine stock of four year old trout. We were congratulating ourselves on the large number and fine condition that our brook trout were in and it was remarked by many visitors. This was the more gratifying when we take into consideration the small number of ponds and the small area of the ponds, but the water at the Wayne hatchery is peculiarly adapted both by its low temperature and softness for brook trout. The temperature of the spring which supplies the ponds is 46 and ordinarily flows about 400 gallons of water a minute. The water is the softest of any water I ever met with, excepting at the Penn Forest Brook Trout Company's property at Weisport. Under ordinary circumstances we can carry nearly double the number of trout in any one of our ponds that can be carried in a pond of the same size at Bellefonte, where the water is very hard and a third more than at Spruce Creek where there is a trace of lime.

A drought prevailed in this section throughout 1908, lowering the Lackawaxen Creek and slightly diminishing the flow in the spring, but with the opening of 1909 there were numerous rain storms that kept the waters up until about the first of August when the drought set in again and continued until the end of the year. It lowered the water supply in the spring day by day from a flow of 450 gallons per minute to seven gallons. The water in the stream also fell rapidly until it had diminished from a normal flow that would fill a 16-inch pipe to less than a four-inch pipe without pressure.

Digitized by Google

The fish began to die off all over the hatchery, except in the bass pond. As soon as I discovered the fish were dying I drew the water from all the ponds, with the exception of the large bass pond and the trout ponds, and transferred all the warm water fish into that pond, where they yet remain. We ran water from the creek into the bass pond twice a week just enough to keep it full and the remaining days of the weeks the entire flow of water was turned into the brook trout ponds. The temperature of the creek water itself was above normal and the amount from the spring not sufficient to appreciably reduce it and consequently there was neither sufficient volume nor sufficient low temperature to maintain the two year old, three year old and four year old trout any length of time. The result was that I lost the greater portion of the stock. I noticed the fish growing weaker from day to day and it was only a short period when they became covered with a fungus growth, which killed them off very rapidly, sometimes at the rate of over 200 a day. I did everything that was in human power or that my knowledge suggested in order to try and save the lives of the fish, and did succeed with the yearlings and fingerlings. I kept promoting the sick and dead fish daily and giving salt baths two or three times a week, but as the fungus was caused purely by weakness, it would not respond to our treatment.

When the cold weather set in and the fish were enabled by returning strength to resist there were only about 500 survivors. The excellence of the water under normal conditions which laid a splendid foundation of vigor and vitality was shown in our fingerlings and yearlings, which by that vigor and vitality were able to resist the small dangers from the small flow and the high temperature and to respond to the treatment which we gave. We did not lose a thousand of them. Thus we have a good stock of two year olds for next year, if we are not burdened with the drought.

When the conditions were at their worst the Commissioner visited the hatchery and we held a consultation as to what was best to be done, for the very existence of the hatchery was at stake. As an outcome of the consultation it was decided to drive a deep well in an endeavor to find an unfailing and heavy flow of water. Deep wells were being driven in different parts of Wayne and adjoining counties and one by Mr. Sterling at the upper end of the hatchery grounds had tapped a vein which was estimated at considerably over 100 gallons a minute. One in the village of Pleasant Mount had given over 100 gallons on test and at a depth of 280 feet. Mr. Sterling's well had tapped a heavy vein at about the same depth, but wishing an artesian, he had driven 120 feet more, and while he struck another vein did not secure an artesian.

An experienced well driver was called into the consultation and a spot at the north end of the hatching house was selected. Rock was found at a depth of 33 feet. At a depth of 60 feet a small quantity of water was struck. At 265 feet there was apparently a good vein, but it proved to be only a pocket for it pumped dry in 20 minutes. At 560 feet a good vein was come upon. The New York, Ontario and Western Railroad Company, which is interested in the prosperity of the hatchery, generously loaned an air compressor and this machine soon demonstrated that we had an unfailing supply of over 160 gallons of water per minute. The compressor was worked without intermission from 7.30 in the morning until 4.30 in

Digitized by Google

the afternoon, under the personal supervision of the Commissioner, the well driver and myself and in the presence of a number of interested visitors. The natural pressure of the vein brought the water to within seven feet of the surface.

We introduced a five-inch pipe for a depth of 180 feet and a two-inch pipe inside of that to a depth of 155 feet. I have since learned that we made a mistake in not using a four-inch pipe and an inch and a half pipe respectively. The air compressor used was a locomotive compressor and therefore one not the best adapted to secure the most nearly perfect work at a minimum expenditure of horse power. Working the engine at 160 strokes to the minute, the water could only be lowered in the well to a depth of 50 feet or 43 feet below the normal height. At anything less than 160 strokes to the minute the water rose in the well.

While the water was measured at 160 gallons on 160 strokes to the minute, this was not the actual measurement, the real flow being undoubtedly much larger because there was a loss of many gallons before it reached the measuring trough. A careful estimate convinced us that the actual capacity is nearer 200 gallons a minute than 160. The water itself is fully equal in quantity to that of the spring. It is soft and with a temperature of 46 degrees. Of course the well is not available for use until there is an appropriation sufficient to pay for a compressor and machinery to operate it. Imperfect tests made indicate that we have a sufficient flow in the creek to move a water wheel to sufficient power to operate a compressor for from at least eight to nine months in the year, and possibly by storing water at intervals in the creek above the hatchery there will be a sufficient supply throughout the year. The general supply to operate a while can come from the new perch pond. Until the well can be operated we have capped it.

The Commissioner this year placed the field work entirely in my charge on account of inability on his part to take charge, the Legislature being in session, and because the old appropriation was so nearly exhausted that a full force could not be engaged. Perch and pickerel work in the field is simultaneous. I decided to operate about eight lakes as follows: Fitz's Long Pond, Bigelow, Beaver Meadow, Sly, Madigan's Long Ponds, Spruce, Shehawken and Rock.

The eggs from Fitz's Long Pond and Bigelow were all perch, the others perch and pickerel. In previous years we always used the shipping cans for the collection and transfer of eggs from the lakes to the hatchery, but some experiments in transportation indicated that the eggs would carry better by the use of egg cases and also that the collection would be facilitated by the use of floating boxes. Cans were therefore abandoned this year excepting on the nearby ponds like Bigelow Lake and Beaver Meadow.

Our collections were much higher on account of this change and with less movement and less expenditure of horse flesh. We would have been able to gather a great many more eggs if the high waters would not have interfered, but as the fish in the lakes in the northeastern part of the county are some later in spawning than those nearby, at the time we were at the height of egg gathering we had some very heavy rains raising the lakes five or six feet. As the eggs were all deposited the water became so deep that we could not find them. This in the future will be overcome by the Commissioner

Digitized by Google

adapting the electric lamp to this work. The men were located on the ponds day and night and as the eggs were gathered they were placed in the floating boxes which were anchored in shored places. Every morning a teamster and collector would leave the hatchery and make a tour of the lakes taking the eggs from floating boxes and packing them in the egg cases and bringing them back to the hatchery. In this way there was collected all together many hundred million eggs, the totals of which will be found later in this report, together with the hatcheries to which they were sent.

The majority of the people of the county recognize the value of field work, especially that part of it which relates to the gathering of perch and pickerel, but there are a few who look upon this feature of our hatchery work with alarm. They believe that by gathering the eggs as we do that we are depleting the lakes of fish and nothing that the Commissioner can say or that I can explain entirely removes this fear. I think it wise therefore to set forth in my report exactly why such fear is groundless.

Yellow perch and pickerel belong to that group of fishes known to ichthyologists and fish culturists as non-nest builders or fish which do not build nests but deposit their eggs indiscriminately on favorable grounds. The eggs of yellow perch and pickerel are fastened together by a glutinous material resembling gelatin and in strings of a yellowish white color. The strings of the perch are from eight inches to five feet long, and the pickerel from four feet to nine feet long. The perch eggs are usually deposited among grasses and weeds and sometimes stones and on gravel at a depth of from a foot to a foot and a half of water. Pickerel among roots or stones at a depth of from three to ten feet.

Most species of fish are spawn eaters and as the eggs of the yellow perch and pickerel may be seen for a long distance it is estimated that fully 90 per cent. of all the eggs deposited are devoured by other fishes before they can be hatched. Storms also will sometimes sweep the eggs from where they have been deposited and float them ashore where they rot. I have seen hundreds of millions of eggs thus washed ashore and lost.

When we gather the eggs we hatch at least 95 per cent., exactly reversing natural conditions. For instance, out of every thousand eggs left to hatch naturally there will be not more than 50 eggs hatched. Out of every thousand eggs that we carry to the hatchery we hatch 950 or 900 more than if the eggs had been left alone. It is our habit to replace 25 per cent. of the hatch in the lakes from which we took the eggs or more than 225 out of each thousand or 175 more than would have hatched naturally, so that by field work, the lake instead of losing is a heavy gainer.

There is still another advantage that the young fish which we return are not from eggs taken from that particular lake, but from another lake that the blood is changed which is admitted to be a great advantage. Several owners have told me that they could see the difference already in the quality since we have begun this kind of work. We also gathered between 25,000,000 and 30,000,000 yellow perch eggs from a new pond started in 1908, but not completed. The majority of the fish we had reared ourselves.

Digitized by Google

While speaking of the advantage of this kind of work for yellow perch and pickerel and the advantage of hatching and planting these fish, I would like to mention again a Wayne county pond known as Hankins and on which I made a report last year. This lake, it will be recalled, until recently did not contain any yellow perch. It was heavily stocked from this hatchery and in 1907 we gatherd from that lake about four quarts of eggs and there were a great many perch caught by fishermen weighing from a half to three-quarters of a pound each, and it is becoming to-day one of the best yellow perch ponds there is in this section of Pennsylvania. I have also seen catches of perch weighing from three-quarters of a pound to a pound and a half each taken from lakes that have been stocked with new blood. I have seen catches on these same lakes four years ago and the weight of the fish never exceeded a quarter of a pound.

Black Bass Work.

As usual most of the bass work at this station was accomplished in the field. As most of the lakes are small they are not well adapted for maintaining a large supply of bass. Many of the owners have requested us to do what we can to clear their waters of this fish so that a more satisfactory species could be put in. Many of the lakes had reached such a condition that not only could no bass be caught, but that fish had destroyed everything else. Therefore we had a wider field for operations than for perch and pickerel.

The men who performed this work were sent to the lakes about the latter part of May. The first lake that the bass were found to be spawning was Sly Lake, but unfortunately out of 60 nests located on Sly there were at least one-half of the eggs destroyed before they hatched. The supposition of the men in charge is that the eggs were destroyed by salamanders, or more properly, newts, which are very abundant in that lake. In Madigan's Long Pond practically every nest of eggs that were found hatched.

In addition to working Long and Sly Lakes the same men also did the work on Independent Lake. Independent Lake is one of the bodies which has suffered severely from the unwise policy of introducing bass in waters of too small area. It is better adapted for trout than it is for bass and the bass destroyed nearly everything in the lake, and having exhausted the food supply the fish themselves are starved, it being rare to find a bass over a pound and a half, the average is much lighter.

They also covered Hickory Pond, which is close by. As it was getting late in the season they were not so successful in getting fish off of these two lakes as they were at the first mentioned. One of our best lakes for gathering bass is Rock, nests in Rock Lake averaging each about three or four thousand fish. The men who did the work on Rock Lake, I had received reports from them that there were a great many bass in Upper Woods Pond, so I concluded to send the men there and see what could be done. They reported to me that the lake was covered with nests, but on investigation the nests would be found to be rock bass. They staked out the nests and reported to me that a nest that would be covered with eggs to-day, to-morrow they would entirely disappear and they could not find

Digitized by Google

out what was destroying them, so I instructed them to crib as many nests as they possibly could. These nests that were cribbed were saved and the fish brought to the hatchery, but they were so small that I failed to save any of them after placing them in the troughs which I had prepared for them. I found them all dead the following day.

I regret to say that most of the fruits of our bass work were lost through the mischievous work of some people whom we suspect, but have no direct proof to convict. We adapted the same system in caring for the young bass that we did with the perch and pickerel eggs, namely, to hold them in floating boxes or cribs of extra large size until the collectors came around. The conscienciousless persons to whom I have referred would, as soon as our men left the field, put in an appearance, destroy the cribs and overturn the floating boxes. From this cause I estimate we lost more than half our catch. These nefarious persons were very careful to evade arrest. I would suggest to the Commissioner that when bass work begins next year to have one or more wardens in the neighborhood for the specific object of watching these people, whose names I will give, and capturing and punishing them if possible, under the hatchery act, and if they are caught to insist on the full punishment, namely, $100 fine and six months' imprisonment.

Bass On the Hatchery.

The same time the men were operating the field I was observing the work of the bass held here in captivity. There has been a great deal written and I have heard a great many remarks being made regarding the condition of bass that have been held in captivity and being artificially fed. During the winter I fed the bass by cutting holes in the ice and lowering the food on wire trays, and it has been a noticeable fact by parties that the bass held here in captivity is as fine and equals any bass found in natural waters. I did not prepare any special nests this season, but my observations the year before were that most of the bass refused to take the Lydell boxes and made their nests out in the pond, which is of a gravel bottom.

One feature I noticed was that every nest built was built close to some stick or limb, which agrees with the observations made by the Commissioner as to wild bass in the natural lakes. At one of the meetings of the Superintendents he stated that at Madigan's Long Pond and also in Sly Lake, he found three-fourths of the nests either along side a rock or in the shelter of a large stone. It has been a theory among bass culturists that it was necessary to place boxes in the ponds and at a distance of at least 15 feet on account of the bass interfering with one another during the spawning act. My observations here do not agree with that theory as I have frequently observed three and four nests within that many feet of space and the fish attending to their nests in perfect harmony with one another.

It is a peculiar fact and one which I would like to have information upon, is the different parts of the pond that bass select for nests in different years. Last year most of the nests in my pond were on the west side and northern end. This year all the nests were built on the east and south sides, but for what reasons I do not know. I have also

Digitized by Google

observed that every nest was selected along side of a piece of wood or some loose limb that would be lying in the pond and the nests were mostly located in a depth of water from three to five feet.

For this vagary I cannot account unless it is that for some unexplained reason the water temperature last year was a little higher on the western side and northern end and this year on the eastern and southern side. While this seems doubtful, I shall test the matter next spring with a thermometer.

There were 33 nests built in the pond and these yielded about 75,000 advanced fry, or about 2,500 to a nest. The eggs on every nest were of fine quality, with the exception of one nest at the northern end of the pond, where they were partly smothered by the accummulation of algae. In the other nests scarcely any dead eggs were seen.

Rearing Bass To Adults.

As it is a very difficult matter to obtain a stock of breeding bass, the Commisioner advised me some few years ago to try and raise our own breeders as we would for brook trout. Three years ago I kept a number of fry for that purpose, estimated to be about 5,000. I started feeding with fine maggots and for the first summer fed a supply of them every day. After the weather got too cold to breed the maggots I started feeding liver and lungs. I had quite a time to get them started to eat that kind of food and had almost despaired of doing so until the thought struck me that by placing them with other fish they would be induced to eat, so I placed a number of perch which I know readily took food, in the same pond, taking care to have them as large a size, or if not larger, than the bass themselves.

It was but a short time afterwards that I observed that the fish were eating and from that time on I have had no trouble in regard to having them feed. At the end of the first year I had about 2,000, or a little less than half of the original stock, and last fall when the bass would have been three years old I had by actual count 1,000, or about one-sixth the original number. The average size of the bass the first year was from four to seven inches. The second year they were about seven to nine inches and in the autumn when started on their third year from eight to 10 inches. What growth they have made since it is impossible for me to say, because of my having to transfer them to the big bass pond on account of the drought.

Yellow Perch Hatchery Work.

It is very gratifying to be able to report the success in rearing yellow perch in ponds. I have at present five or six thousand adult perch which were reared and fed artificially from the time they were hatched. I find it a very simple matter to teach the perch to feed. After they attain the size of two or three inches in length they commence to feed very ravenously, taking liver and lungs, and I also find that they take boiled corn meal and seem to thrive on it fully as well as on meat.

Digitized by Google

Lake Trout.

There was received at this hatchery from the Union City hatchery 100,000 lake trout eggs which were hatched and retained in the troughs until they reached the advanced fry stage when they were placed in various lakes throughout the northeastern part of Pennsylvania.

Cut-Throat Trout.

The cut-throat trout eggs received this season arrived here in very fine shape. As they arrived at a time when they were reconstructing the hatching house, I had two troughs erected and connected with the small spring adjacent to the trout pond where they were successfully hatched and held until the advanced fry stage, and under your instructions 5,000 were sent to Spruce Creek and the balance planted in waters in Wayne county. My observation in regard to this fish is that I do not think it advisable to procure any more eggs, as the reports of fish being caught or seen are very few, and in fact none that could be substantiated. In working in different lakes where they have been planted the men failed to find any of them.

Silver Side Salmon.

As usual, in the month of January I received a consignment of 100,000 silver side salmon eggs from the United States Bureau of Fisheries Hatcheries, located in the State of Washington. The eggs arrived in perfect condition and were hatched and held at the hatchery until they reached the size of fingerlings No. 1, when, by your orders, I forwarded 10,000 to Spruce Creek hatchery, 5,000 are still retained in the ponds here and the balance have been planted in water tributary to the Delaware river.

Wall-Eyed Pike.

The wall-eyed pike eggs which were forwarded from the field at Sandusky, Ohio, to this station, did not arrived in very good condition. This is the second year that the eggs from the field arrived here in bad condition and I feel positive it is owing to the carelessness on some one's part connected with the field, as it is customary for the spawntakers to place cards on the different trays of eggs stating the date the eggs were taken. Comparing these cards with the date that the eggs arrived here would be a difference of six or seven days. I think if the eggs were not allowed to remain in the field so long and receive more ice and attention, they would arrive in better shape.

The eggs I received from Mr. Hartman of the Erie hatchery arrived here in very good shape and the hatch was very successful. These fish were planted partly on applications and partly by the Department in waters tributary to the Susquehanna and Delaware rivers. If it is at all possible for you to do so, I would like about 10 times the amount of wall-eyed pike eggs that I am getting now, as it is a noted fact that the fishing both in the Susquehanna and Delaware is becoming very good, and both these fishes thrive and do well in either river and are more sought after by the fishermen than the bass are.

Digitized by Google

Cat Fish Work,

The results were very gratifying with my work on catfish in the year 1908, and I was already congratulating myself on what the results would be in the year 1909. I am sorry to say that my reports in that respect for this year were a total failure. I hardly know what to attribute it to. I had an enormous numer of adult fish, estimated at 2,000. Had them in ponds where they could be readily watched and seen, but the results as far as spawning was concerned, I found but one school of about 2,000 fish.

Extensions and improvements.

The hatching house was entirely too small for the rapid annual increase of work, and being a building 65 feet in length by 20 in width, only allowed a single set of hatching troughs for trout and in addition to the trout work, there was also a great deal of battery work to be done and the battery was set over the troughs. A great deal of the trout work we were compelled to do outside, often times the thermometer being below zero.

It was decided by the Commissioner to build an addition so that all work could be done under cover and at the same time expand the work. The new addition gives us a building 70 feet long by 65, making plenty of room for three series of trout troughs and a larger space of 26 feet by 60.

In addition to the trout troughs and battery there was a large concrete retaining tank built 11 feet high by seven feet square to supply water to the battery and ponds. The water is conducted into the tank through a 10-inch pipe leading from the perch pond.

In addition to building the tank the concrete wall surrounding the spring was repaired and raised 12 inches higher than formerly. In addition to building the hatching house, work was also resumed on the new perch pond, the lower portion of which is about 100 feet above the hatching house and the upper end is only a few feet below the north end of the hatchery. It has a total length of about one-tenth of a mile. The pond was not completed when winter set in, but we succeeded in raising the embankment to a height of 10 feet and two-thirds of the excavation has been completed. The pond yet has to be raised two feet at the outlet and for a portion of the sides. The pond will serve many purposes.

It is designed first to hold yellow perch for breeding purposes and will have a capacity for about 50,000 fish. Second, it is intended to supply water for the battery in the hatching house by means of the 10-inch pipe already mentioned. Third, it is intended from it to supply the other ponds on the hatchery. When this pond is completed we may be able to grade the whole upper half of the property and give it a park like appearance.

Ice House.

There was also erected an ice house 26 feet long by 20 feet wide and 16 feet high, having a capacity of about 200 tons. This is none too large since with the cutting away of the woodland above the

Digitized by Google

hatchery the temperature of the stream will undoubtedly rise above normal and compel the use of ice whenever any portion of the stream is to be turned into the trout ponds.

The output for the year commencing December 1, 1908, and ending November 30, 1909, follows:

The above is respectfully submitted.

N. R. BULLER,
Superintendent.

Fish, etc., Distributed from December 1, 1908, to November 30, 1909.

Pickerel.

Wayne county,	100,000,000
Susquehanna county,	100,000,000
Pike county,	40,000,000
Lackawanna county,	30,000,000
Luzerne county,	30,000,000
Blair county,	2,000,000
Carbon county,	5,000,000
Mifflin county,	6,000,000
Huntingdon county,	7,000,000
Monroe county,	30,000,000
Lehigh county,	5,000,000
Wyoming county,	10,000,000
Northampton county,	6,000,000
Bradford county,	4,000,000
Columbia county,	1,000,000
Total,	376,000,000

Silver Side Salmon.

Delaware River and Spruce Creek,	85,000

Rainbow Trout, Adults.

Lackawaxen River,	900

Tadpoles and Frogs.

Wyoming county,	3,500
Lackawanna county,	2,500
Snyder county,	500
Lycoming county,	500
Northumberland county,	13,500
Lehigh county,	1,000
Susquehanna county,	9,500
Schuylkill county,	7,500
Total,	38,500

Digitized by Google

Brook Trout.

Luzerne county,	167,000
Lycoming county,	32,000
Susquehanna county,	109,000
Schuylkill county,	111,000
Carbon county,	168,000
Sullivan county,	132,000
Bradford county,	78,000
Pike county,	97,000
Lackawanna county,	148,000
Wayne county,	135,000
Berks county,	40,000
Wyoming county,	16,000
Lehigh county,	34,000
Monroe county,	34,000
Northampton county,	38,000
Total,	1,339,000

Yellow Perch.

Wayne county,	200,000,000
Pike county,	10,000,000
Bradford county,	5,000,000
Wyoming county,	3,000,000
Schuylkill county,	3,000,000
Lehigh county,	5,000,000
Susquehanna county,	50,000,000
Luzerne county,	20,000,000
Lackawanna county,	30,000,000
Monroe county,	1,000,000
Columbia county,	1,000,000
Total,	328,000,000

Small Mouth Black Bass, Advanced Fry.

Pike county,	15,000
Lehigh county,	15,000
Snyder county,	3,000
Dauphin county,	5,000
Montour county,	1,000
Lackawanna county,	8,000
Schuylkill county,	10,000
Bradford county,	17,000
Wayne county,	87,000
Wyoming county,	17,000
Carbon county,	11,000

Digitized by Google

Northampton county,	1,000
Luzerne county,	10,000
Susquehanna county,	33,000
Total,	233,000

In addition to the above there were 21,500, intended for Cumberland and Franklin counties, which were detained so long by the wreck on the railroad, that it was necessary to plant them in the Susquehanna river at Northumberland, making the total 254,500.

Lake Trout, Advanced Fry.

Susquehanna county,	25,000
Luzerne county,	6,000
Wayne county,	64,000
Total,	95,000

Wall-Eyed Pike.

Susquehanna county,	18,000,000
Pike county,	1,500,000
Wyoming county,	3,500,000
Wayne county,	3,000,000
Bradford county,	10,500,000
Luzerne county,	1,500,000
Total,	38,000,000

Cut-Throat Trout.

Lackawaxen River, Bigelow Lake, Long Pond and Spruce Creek Hatchery,	50,000

Cat-Fish, Adult.

Dauphin county,	1,000

Summary.

Pickerel,	376,000,000
Silver side salmon,	85,000
Rainbow trout,	900
Tadpoles and frogs,	38,500
Brook trout,	1,339,000
Yellow perch,	328,000,000
Small mouth black bass,	233,000
Lake trout,	95,000
Wall-eyed pike,	38,000,000
Cut-throat trout,	50,000
Catfish,	1,000
Total,	743,842 400

Digitized by Google

TORRESDALE HATCHERY, STATION NO. 5.

Report of Jerry R. Berkhous, Superintendent.

Hon. W. E. Meehan, Commissioner of Fisheries:

Sir: Herewith is the report of the Torresdale Hatchery, Station No. 5, from December 1, 1908, to November 30, 1909.

Owing to the fact that there were no surplus white fish and lake herring eggs from Erie and Union City hatcheries it left this hatchery idle again through the winter months so far as hatching was concerned. The winter being very mild we were able to work out on the grounds most of the time. The work mostly consisted of grubbing out stumps, clearing away dead trees and grading. The shipping cans were painted with two coats of paint, and the hatching house got in readiness for the spring work. The fry ponds were cleaned and put in readiness for operation in the spring.

Yellow Perch.

Early in the spring there were branches of trees placed all around the perch pond for the perch to deposit their eggs and April 1st there were three strings of eggs gathered with the water temperature in the pond at 52 degrees. The following day there were eight strings of eggs gathered the water temperature remaining the same.

I took notice that all of the first spawning was done by the smaller fish. The period of spawning lasted through the month of April with the water temperature varying from 48 to 58 degrees. The largest number of strings of eggs gathered in one day was 120 strings or 100 quarts. I found that the fish all took to the east or sunny side of the pond to deposit their eggs the same as the year previous. All the eggs gathered from the pond were very nice and about 98 per cent. of them were hatched. There were only one or two strings that were not well fertilized by the male fish. By permission of the man who has charge of Bristol Lake there were a large number of yellow perch eggs gathered and brought to the hatchery from there. After they were hatched a part of the fry were planted back in the lake, making by far a greater number of perch fry in the lake than there would have been if the eggs had been left and allowed to hatch naturally.

Pickerel.

The fourth day of May I received the first consignment of pickerel eggs from N. R. Buller, Superintendent of the Wayne County Hatchery. There were 300 quarts in this shipment. They were shipped in cases and carried through with practically no loss. They could not have been better had they been gathered from one of the hatchery ponds. The second shipment came through in the same manner, but

Digitized by Google

as it was further on in the spawning season they were not quite as good as the first lot. The water temperature through the period of incubation was from forty-eight to seventy degrees. The applications were all filled and a large number planted in the Delaware river by the Department.

Wall-eyed Pike.

The wall-eyed pike eggs were shipped here by Philip H. Hartman, Superintendent of the Erie Hatchery. They were all eyed up eggs and hatched in a very few days after they were received. The applications were all filled and one plant was made by the Department in the Delaware river.

Shad.

April 28th with the water temperature in the Delaware river at 58 degrees, Mr. Hansbury and Laconey Brothers, all gill net fishermen on what is known as the Torresdale drift, brought shad eggs to the hatchery. Owing to the fact that the house was full of eggs at that time we could not devote all of our time to the shad work, but May 3d the spawntakers were scattered along the Delaware river from Washington Park to Tullytown so there would not be any shad eggs lost.

As soon as the hatching house was cleared of the other eggs we turned to the shad work on the Delaware river in full force and put as many spawntakers on as the money from the appropriation would allow. Most of the gill-net fishermen took their own eggs, after which the eggs were gathered from them by a hatchery man. The fishermen generally took great pains to save all the eggs they could and be sure that they were taken right. They are now realizing the great benefit it is to them and to the public by the Department propagating shad on the Delaware river. The fore part of the shad fishing was very good and as many as one hundred were often caught on one drift. The shad run very large in size, averaging about four pounds, and some extra large shad were caught that weighed eight and nine pounds. They seemed to run in sex about equal, that is, the same number of male and female, and they would average about one ripe female out of every ten caught on the Torresdale drift.

About the middle of May the weather got cold and there was lots of rain, which made the water in the river very muddy, and at one time the water got as low as 42 degrees. Then the shad began to get scarce and for a time the fishermen would hardly catch enough to pay their expenses. After the weather got more favorable and the water got warmer the shad began to come in the river again, but as the season was getting nearly over a great many of them were spawned out and nearly every roe shad caught was ripe enough so that the eggs could be taken. The eggs remained fertile and turned out well until the last of the season. The average temperature of the Delaware river through the shad spawning period was 60 degrees. The average amount of eggs taken from each shad was 50,000.

Sturgeon.

Following your instructions I succeeded in getting about eighty sturgeon, averaging from eighteen inches to three feet long, from field work done on the Delaware river. Some of the female fish were found to have eggs, but were not far enough advanced to spawn.

Digitized by Google

Following your orders they were placed in a pond and examined carefully every day. First, I found that there were plenty of ripe males among them, but no ripe females. The first ripe female was found April 9th, and when the eggs were taken from her it was found that the fish was only about half ripe and the eggs could not all be taken. At this time there were plenty of ripe males.

The eggs were taken by the dry method and allowed to mat or stick together. After they had hardened they were placed in a hatching jar. Finding that the eggs were very heavy, they had to have about twice as much water running through them as the ordinary eggs would have to have in order to work them at all in the jar. The older the eggs became the more they seemed to glue themselves together. They could not be separated because the shell of the egg would break before they would separate.

There was a very small percentage of them hatched for the reason that they could not be separated and they fungussed and smothered before they hatched. What part of these eggs that hatched broke out of the shell April 25th and 26th. The average water temperature through their hatching period was 48 degrees. The young fish resembled a very young frog tadpole. The eggs from the second fish were taken about one week later. They were taken with very little water in the pan, and, after they were fertilized with the milt of the male fish, they were immediately put into a pail of mud and water and stirred constantly for about four hours, frequently changing the mud and water. By so doing they were not allowed to stick together. After this they were placed in a hatching jar and a very large stream of water run through them to keep them from matting together. They had to be feathered very often and had to be screened apart four times a day to keep them separated. The water was a little warmer and it did not take quite as long for them to hatch as the first lot. According to the number of eggs in each lot I do not think that the second lot hatched as many fish as the first lot.

I am of the opinion that they should be hatched on trays the same as the trout. I think that they should be put on trays before they commence to stick together, and then the dead eggs should be picked off without doing any harm to the live ones. I am also of the opinion that the little sticktights , which completely cover the shell of the eggs and cling to anything that touches it, are for a protection to the egg.

Through your invitation I had the pleasure of showing Mr. Titcomb, from the United States Bureau of Fisheries, the sturgeon work done at this hatchery.

Altogether there were four hundred sturgeon hatched. Some of them were preserved for reference and the balance were planted in the Delaware river.

Large Mouth Bass.

We have found by stocking small mouth bass in the hatchery ponds at this station that they do not thrive well, so, following your directions, I have taken up the large mouth bass work altogether. The adult bass were left to build their own nests on account of there being so much gravel on the bottom of the pond. There was also lots of moss growing in the pond. The bass spawned and hatched the latter part of April. After the fry were old enough to raise to the surface of the water they seemed to all go into one big school. After this a

Digitized by Google

greater part of the fry were taken out by means of a small net and transferred to the fry ponds until the shipping time came. When they were caught for shipment it was found that the fry that were left with the adult fish were two and three times as large as the ones that were removed to the fry ponds. I recommend that another year you permit me to leave the fry in the pond with the adult fish until just before such a time as the adult fish start to prey on the young ones.

October 15th I received from A. G. Buller thirty-six adult bass and 585 fingerling bass, which were very fine fish. I have a total now of over one hundred adult bass which are in very good condition. They should produce next spring about 150,000 young bass.

Catfish.

Early in the spring the adult catfish were placed in their brood ponds. The larger part of them spawned in the month of May, although there were a few that did not spawn until about the middle of June. They consisted of the two varieties, the white or channel and the common yellow catfish, and one variety seemed to do as well as the other. After the fish were hatched the two old fish, male and female, would school the young fish together in a round ball and guard them very closely. They were left with the old fish in this manner until they got to such an age that they would rise to the surface of the water in a rolling ball, then they were taken out by means of a net and put into the fry ponds, where they were fed and cared for until shipping time. It has been found that after the young fish reach a certain age the old fish will feed on them.

Sunfish.

The Lake Erie blue gills and a few long ears were placed in the large sunfish brood pond and left to build their nests on the gravel bottom of the pond. After the young fish were hatched they were not taken out of the pond, but left in with the adult fish. This, I think, can be safely done providing the adult fish are kept very well fed so as to prevent them from eating their young.

As I did not have enough brood fish of the blue gill variety I had a pond of the common and yellow sunfish, which were hatched and cared for in the same manner as the blue gills, which, I must say, turned out a great many more fish than I expected. Although the applications were not quite all filled there was a greater number of fish shipped than the year before.

Frogs.

The frogs, after the spawning season, were turned out and allowed to go from one hatchery pond to another on account of tearing out their pond for the purpose of building a large catfish pond. The young frogs were hatched mostly in the goldfish and sunfish ponds. They were mostly shipped in the tadpole stage in the fall of the year as before. I find that by turning the adult frogs loose on the hatchery grounds that they do not leave, but they are liable to jump into the bass pond and are devoured by the bass.

Following your orders, there will be a pond made for them in the near future.

Digitized by Google

Terrapin.

Removing the large terrapin to the pond which was fitted up for them this spring, they were kept under a very close watch until about the middle of June, when it was found that they had commenced to dig in the sandy banks of the pond. Very shortly after this it was found that they had deposited their eggs in the sand and covered them. Being very eager to find out all we could about the terrapin, the eggs were occasionally dug up and examined, which we have found since was a decided mistake. Just before the time they should have begun to hatch the ground moles got into the banks and dug some of the eggs completely out and buried some of them so deep that they smothered. This made the terrapin work very nearly a failure this year, but at any rate there were a few of them hatched out and crawled into the pond with the large ones.

Goldfish.

The three hundred triple tail or Japanese goldfish that were put into the large pond to carry through the winter were too delicate to stand the cold weather and the most of them died. The other fish were spawned the old way by putting the water hyacinths in the pond with the adult fish and after the fish would deposit their spawn on these plants they were removed to another pond and left there until they hatched. I thoroughly favor your idea of doing away with the goldfish at this hatchery for the ponds that they occupy are badly needed for fry ponds for the various other kinds of fish reared at this station.

Improvements.

The creek which feeds the series of hatchery ponds enters the grounds at Linden avenue and runs through the centre of the grounds to the Delaware river. This creek is made up of springs, but as it is about one and a half miles in length it drains considerable territory, consequently in time of a heavy rain the water comes down with a rush and is very muddy, especially in the springtime when the fish are spawning in the ponds and should have clean water.

Following out your directions after the hatching season was over in the spring, I started a concrete sluiceway at the extreme upper end of the grounds, or where the creek crosses Linden avenue, running this sluiceway directly between the two series of ponds, one series one the east side and the other series of ponds on the west side of the sluiceway. The walls were made ten inches thick and run from two feet six inches to three feet six inches high. The sluiceway was made four feet in width. This was built a length of 685 feet of double wall to the upper end of the sturgeon and pickerel pond No. 2. Finding that we would be able to get running water into the catfish pond, which had always been supplied by the pump from the river, by going through the knoll a depth of eleven feet in the deepest part, the ditch was dug and 18-inch terra-cotta pipe laid through the knoll a distance of 476 feet. The terra-cotta was connected with the sluiceway at the upper end. An open concrete sluice was built at the lower end of the pipe leading into the Delaware river a distance of 105 feet. The complete length of the sluiceway is 1,266 feet. Each pond is connected with this sluiceway with an intake and overflow pipe. The water in

Digitized by Google

the sluiceway is regulated by means of splash boards, and any pond along the sluiceway can be drawn off or filled up independently of any other. The water can all be run direct to the river or can be turned into any of the ponds if needed.

The Correction Labor was sent here through the orders of Mr. Clay, Director of Public Safety, and helped to build this sluiceway. There were also three new ponds built on the east side of the sluiceway at the upper end of the grounds, one being built directly below the other. The first one is 38 feet wide and 123 feet long, the second 38 feet wide and 120 feet long, and the third one 38 feet wide and 129 feet long. The first and second one will be used as fry ponds and the third one will be used for a catfish brood pond. At the present time we are at work on a catfish brood pond that will be over 200 feet long when completed. There was also a concrete wall built between fry ponds No. 2 and No. 3 and the large sunfish pond which was two and a half feet high and over 100 feet long.

By your orders, there were about fifty very fine selection of different trees planted on the hatchery grounds from the Meehan Nurseries.

The electric lights have also been installed on the hatchery grounds. There are three arc lights along the hatchery ponds, which is of great benefit at night in watching the ponds.

The hatching house has also been wired and lights will be turned on when needed. Although there are yet lots of improvements to be made at the Torresdale Hatchery, the general condition of the hatchery and the brood fish are good.

I am glad for another opportunity of thanking you for your valuable suggestions and courtesies given me.

The output of fish from December 1, 1908, to November 30, 1909, is herewith attached.

Respectfully,

J. R. BERKHOUS,

DISTRIBUTION OF FISH, ETC., FROM DECEMBER 1, 1908, TO NOVEMBER 30, 1909.

Large Mouth Bass, Advanced Fry and Fingerlings.

Bedford county,	6,545
Berks county,	13,475
Blair county,	1,925
Bucks county,	11,550
Cambria county,	770
Chester county,	11,935
Cumberland county,	770
Delaware county,	2,695
Huntingdon county,	1,155
Juniata county,	385
Lancaster county,	3,080
Lebanon county,	6,160
Mifflin county,	1,195

Digitized by Google

Montgomery county,	20,020
Perry county,	770
Philadelphia county,	385
Westmoreland county,	385
Total,	83,200

Catfish, Advanced Fry and Figerlings.

Adams county,	6,000
Berks county,	101,500
Bucks county,	27,000
Chester county,	2,500
Cumberland county,	12,000
Dauphin county,	10,000
Delaware county,	6,000
Franklin county,	12,500
Lancaster county,	24,000
Lebanon county,	4,500
Montgomery county,	54,500
Northampton county,	1,000
Philadelphia county,	53,000
York county,	18,500
Total,	333,000

Catfish Adult.

Philadelphia county,	500

Frogs and Tadpoles.

Berks county,	14,000
Bucks county,	6,000
Chester county,	9,500
Clearfield county,	3,000
Cumberland county,	1,000
Lancaster county,	1,000
Lebanon county,	4,000
Mifflin county,	3,000
Montgomery county,	7,000
York county,	51,500
Total,	100,000

Calico Bass, Adults.

Cambria county,	50

Sunfish, Advanced Fry and Fingerlings.

Adams county,	8,000
Bedford county,	5,000
Berks county,	30,000
Bucks county,	15,000
Cambria county,	4,000

Digitized by Google

Chester county,	3,000
Cumberland county,	9,000
Dauphin county,	5,000
Delaware county,	1,500
Franklin county,	2,500
Fulton county,	1,000
Huntingdon county,	2,000
Indiana county,	24,000
Lancaster county,	14,500
Lebanon county,	3,000
Mifflin county,	1,000
Montgomery county,	46,000
Northampton county,	1,000
Perry county,	2,000
Philadelphia county,	4,000
Somerset county,	1,000
Westmoreland county,	2,000
York county,	52,500
Planted by Department in Delaware river,	63,000
Total,	300,000

Sunfish, Adults.

Philadelphia county,	132

Goldfish, Fingerlings.

Crawford county,	35
Bucks county,	50
Lackawanna county,	200
Montgomery county,	200
Schools and public places in Philadelphia county,	2,615
York county,	100
Total,	3,200

Goldfish, Adults.

Bucks county,	50
Chester county,	30
Erie county,	100
Montgomery county,	100
Philadelphia county,	420
Total,	700

Sturgeon Fry.

Planted in the Delaware river,	400

Shad Fry.

Planted in the Delaware river,	15,000,000

Digitized by Google

Wall-eyed Pike Fry.

Berks county,	125,000
Blair county,	1,275,000
Cumberland county,	975,000
Huntingdon county,	600,000
Indiana county,	575,000
Juniata county	75,000
Lancaster county,	250,000
Lebanon county,	375,000
Mifflin county,	525,000
Montgomery county,	150,000
Perry county,	300,000
Planted by department,	555,000
Total,	5,780,000

Pickerel Fry.

Bedford county,	2,400,000
Berks county,	9,760,000
Blair county,	2,960,000
Bucks county,	6,560,000
Cambria county,	3,600,000
Chester county,	720,000
Cumberland county,	1,440,000
Dauphin county,	1,440,000
Delaware county,	720,000
Franklin county,	800,000
Huntingdon county,	2,160,000
Indiana county,	720,000
Lancaster county,	2,080,000
Lebanon county,	480,000
Mifflin county,	240,000
Montgomery county,	6,720,000
Perry county,	480,000
Westmoreland county,	240,000
York county,	1,760,000
Planted in Delaware river,	18,420,000
Total,	63,700,000

Yellow Perch Fry.

Adams county,	360,000
Bedford county,	1,080,000
Berks county,	12,660,000
Bucks county,	4,560,000
Cambria county,	1,200,000
Carbon county,	1,620,000
Centre county,	180,000
Chester county,	5,580,000
Cumberland county,	1,080,000
Dauphin county,	1,680,000
Delaware county,	360,000

Digitized by Google

Franklin county,	900,000
Huntingdon county,	900,000
Indiana county,	5,880,000
Lancaster county,	1,620,000
Mifflin county,	540,000
Montgomery county,	8,580,000
Philadelphia county,	600,000
Somerset county,	360,000
Westmoreland county,	480,000
York county,	3,120,000
Planted by the Department,	18,160,000
Total,	71,500,000

Summary.

Large mouth bass, fry and fingerlings,	83,200
Catfish, fry and fingerlings,	333,000
Catfish, adults,	500
Frogs and tadpoles,	100,000
Calico bass, adults,	50
Sunfish, fry and fingerlings,	300,000
Sunfish, adults,	132
Goldfish, fingerlings,	3,200
Goldfish, adults,	700
Sturgeon, fry,	400
Shad, fry,	15,000,000
Wall-eyed pike, fry,	5,780,000
Pickerel, fry,	63,700,000
Yellow perch, fry,	71,500,000
Total,	156,801,182

Digitized by Google

ERIE AUXILIARY HATCHERY, STATION NO. 6.

Report of A. G. Buller, Superintendent.

Hon. W. E. MEEHAN,
Commissioner of Fisheries, Harrisburg, Pa.

Sir: I beg to submit the following as my report from December 1, 1908, to November 30, 1909.

December 2, 1908, I received 8,320,000 lake herring eggs from Erie, and December 4th, 1,872,000 white fish eggs from Conneaut Lake Hatchery. These eggs were transferred to this station as Mr. Safford was unable to handle the eggs at his hatchery owing to a scarcity of water. The condition of the white fish and lake herring eggs in the house at this time did not look promising for a big output of fry as when the eggs were received from the field they were in bad condition, and I am sure the white fish eggs were not properly cared for before shipping from the field.

The herring eggs also were of a very poor quality. The fry when hatched were planted in Lake Erie. You directed me to send one million of the lake trout eggs I mentioned of having in my previous report to the Corry Hatchery, and after the eggs were eyed one hundred thousand went to the Wayne County Hatchery.

The fish began hatching February 15th, and were planted in Lake Erie during the month of April.

April 20th, I received the first shipment of pike-perch eggs from Erie. The entire number of pike-perch eggs received was 57,400,000. The yellow perch in the pond at this station began to spawn April 22d, and the entire number of eggs collected from this pond during April and May was 20,000,000. I received from the Wayne County Hatchery 11,200,000 yellow perch eggs, and 22,500,000 pickerel eggs. Heretofore the perch and pickerel eggs have been carried in cans used for shipping fry, but we have found this to be unsatisfactory. This year the eggs were shipped in cases with sufficient ice to hold an even temperature. When they arrived here I found them in splendid condition, and it has proven to be an excellent way of carrying these eggs as there was practically no loss in the hatching.

Owing to the large number of fish eggs to be handled it was neces sary to carry a large number of eggs in the trout hatchery on trays, as so far there is only one battery installed in the battery house. The distribution of these fish will be found in my report of distribution.

Owing to this station being in easy touch with Erie you directed me to ship some of my adult small mouth black bass to the Torresdale Hatchery. I shipped seventy-nine, leaving twenty-four in the pond. I expected to get sufficient breeders from the lake before spawning season, but, unfortunately, I did not receive any fish until after the spawning season was over. The bass began to spawn the 28th of May, and by the 31st there were 10 nests. This was the entire number of bass nests. My breeders averaged about four pounds each and there

Digitized by Google

was a large number of eggs deposited on each nest. From the 10 nests there were 50,000 fry hatched. The number of fish hatched was not sufficient to fill the applications assigned to me. You ordered 72,000 to be sent here from the Wayne County Hatchery.

From experience it has been learned the fry gathered from the lakes cannot be held successfully in the ponds. For this reason the fry were distributed as soon as they reached this station. I have come to the conclusion, from my own experience in the work, that if the black bass fry taken from the ponds were distributed at the age of ten to fifteen days there would be better results obtained.

I wish to speak of one of my ponds which contained 19 two year old black bass. These bass I had raised. One day I noticed one of the bass cleaning a nest. I watched this closely for ten days and I examined the nest every day for eggs, but found none, nor could I see but the one fish at or near the nest at any time. After the tenth day the fish left the nest entirely. This leads me to believe the female bass does not spawn at two years old, or it might have been possible that among all the fish in the pond there were not any females.

I am glad to report my output of sunfish was larger this year than any previous year. I distributed 297,000 fingerlings No. 1, and have a large number left in the pond. I was able to distribute 15,000 calico bass fingerlings No. 1. Owing to insufficient room I had the calico and rock bass in one pond. Next spring I intend separating them and look for better results. The rock bass hatched very few fry, and I will raise what were hatched for breeders.

I know you are quite anxious to have success with the hatching of sturgeon at this station. Last year I received two small sturgeon from Erie and four more this summer. They averaged about three feet in length. This number of fish seems small, but I hope to be able to make a beginning with the work next summer.

During April I cleaned several of the smaller ponds and transferred from one of the ponds 1,013 blue gill and long eared sunfish, 177 rock bass and 111 calico bass. These fish are from one to one and a half years old and are being retained for stock fish.

In the fall I put 1,000 small mouth black bass in one of the ponds, averaging in length about three inches. These fish were fed regularly, and the pond was stocked sufficiently with minnows to supply them with food during the winter. When the pond was cleaned this spring we removed 479 bass, and a large number of minnows. I put these fish in another pond and they were again well fed. They ate freely of ground lungs in connection with the minnows given them. In August I again assorted them and found 283 bass. They had grown to almost twice the size they were at the time they were placed in this pond. Altogether there was a loss of 717 fish out of the 1,000 in less than one year's time. This again proves how destructive the bass are. This fall I placed 700 fingerlings No. 2 in one of the bass fry ponds and am giving them special attention as I should like to find some way to overcome the loss.

During the month of October I assorted all my stock fish and found them to be healthy and in fine condition.

Dr. H. M. W. Hardwicke, of Erie, purchased a private hatchery at Rootville, Crawford county. There were a number of large mouth bass breeding fish, also bass of this year's hatching in the ponds, and as Dr. Hardwicke does not intend propagating large mouth black bass he asked if I thought the Commissioner would make an exchange for

Digitized by Google

goldfish. I wrote you in regard to the matter and you consented to the exchange, which was made during October for 36 adults and 585 small bass. Dr. Hardwicke received 52 fine goldfish. The bass were sent to the Torresdale Hatchery.

During the month of November I received 52,722,000 lake herring eggs. The eggs are in better condition than they were last year and the outlook at present is favorable for a good percentage of the eggs to hatch.

During the summer we built a concrete wall on both sides of the creek from the splash at the supply pond to the first bridge, a distance of about eight hundred feet, also concrete side walls and apron at the splash.

The grounds were graded at different places, trees planted, two new ponds completed, and a third pond partly finished. These ponds are 50 x 150 feet in size. All the spare time was utilized in hauling gravel for the driveways.

In October you directed me to go to Bellefonte to assist in taking eggs. After being there two weeks I went to Mr. Charles A. Wolter's hatchery at Weissport for one week, then returned to Union City in order to get this hatchery ready to receive the winter supply of eggs.

Respectfully,

A. G. BULLER,
Superintendent.

FISH, ETC., DISTRIBUTED FROM DECEMBER 1, 1908, TO NOVEMBER 30, 1909.

White Fish Fry.

Planted in Lake Erie,	1,500,000

Lake Trout, Advanced Fry.

Planted in Lake Erie,	1,600,000

Lake Herring Fry.

Planted in Lake Erie,	6,500,000

Yellow Perch Fry.

Bradford county,	1,057,440
Clinton county,	3,437,680
Crawford county,	1,145,560
Clearfield county,	1,762,400
Erie county,	9,693,200
Planted in Lake Erie,	2,731,720
Lycoming county,	5,904,040
Tioga county,	7,049,600
Union county,	1,762,400
Warren county,	6,344,640
Total,	40,788,680

Digitized by Google

Pike-Perch Fry.

Clearfield county,	1,250.000
Dauphin county,	7,000,000
Forest county,	3,250,000
Lycoming county,	3,350,000
Montour county,	2,000,000
Union county,	900,000
Warren county,	4,500,000
York county,	7,700,000
Total,	29,950,000

Pickerel Fry.

Bradford county,	457,200
Clinton county,	1,973,100
Crawford county,	174,450
Erie county,	9,769,200
Lycoming county,	2,384,150
Northumberland county,	872,250
Tioga county,	359,900
Union county,	1,221,150
Warren county,	5,652,000
Total,	22,868,400

Sunfish, Fingerlings No. 1.

Allegheny county,	99,000
Crawford county,	15,000
Erie county,	180,000
Philadelphia county,	3,000
Total,	297,000

Calico Bass, Fingerlings No. 1.

Crawford county,	15,000

Small Mouth Black Bass, Advanced Fry.

Adams county,	2,000
Erie county,	13,500
Lycoming county,	12,500
Warren county,	23,800
York county,	27,000
Total,	78,800

Small Mouth Black Bass, Fingerlings No. 1.

Centre county,	900
Clinton county,	2,400
Lycoming county,	7,500
Northumberland county,	2,100

Digitized by Google

Sullivan county,	5,100
Tioga county,	3,600
Union county,	5,100
Warren county,	7,800
Total,	34,500

Small Mouth Black Bass, Fingerlings No. 2.

Erie county,	1,920

Summary.

Lake trout, advanced fry,	1,600,000
White fish fry,	1,500,000
Lake herring fry,	6,500,000
Yellow perch fry,	40,788,680
Pike-perch fry,	29,950,000
Pickerel fry,	22,868,400
Sunfish, fingerlings No. 1,	297,000
Calico bass, fingerlings No. 1,	15,000
Small mouth black bass, advanced fry,	78,800
Small mouth black bass, fingerlings No. 1,	34,500
Small mouth black bass, fingerlings No. 2,	1,920
Total,	103,634,300

Digitized by Google

CRAWFORD HATCHERY NO. 7.

Report of W. H. Safford, Superintendent.

Hon. W. E. Meehan, Commissioner of Fisheries, Harrisburg, Pa.

Dear Sir: I beg to submit to you the following report of Crawford Hatchery for the year beginning December 1, 1908, and ending November 30, 1909.

The year just ended has been one of progression at this station. We have practically doubled our pond area, and some very necessary buildings have been erected. It is a well-known fact that all hatcheries have their good and bad years. With the exception of the loss of our water supply to our battery early last fall, we have had what I call a banner year, not only in our construction work, but in the most important thing of all, our fish culture.

We have succeeded in increasing this year's hatch over that of last year in every specie propagated with the exception of one. Some we have more than trebled. I am fully aware of the fact that this is expected in a new station. This one still being in its infancy its limit has not been reached by any means. It is, therefore, a great pleasure to me to be able to report to you an increase of fish produced from year to year.

The generous division by you of the appropriation at your command toward this station has made this possible. In our general work of the station we have succeeded in eliminating some very unsightly places on the grounds. We were able to do this much faster and with less expense this year than heretofore. As I have stated in previous reports, in pond construction the excavations here are always heavy, and if we had not had places to fill (of which I will speak later), what to have done with the dirt would have been quite a problem. As it was, as fast as we removed earth from pond we had a place to use it so that when the pond was finished we had the upper end of the grounds pretty well to its grade.

The weather conditions the past summer and fall were ideal for outdoor work. This gave us ample opportunity to finish to completeness everything on which we had planned.

The most excessive drought ever known in this section of the State started last year and caused a heavy cut in our output. When the season for white fish and lake herring arrived last fall, I thought I had enough water to be able to operate at least one-half of the battery. The 24th of November the eggs arrived and were placed in the battery. The next morning the weather became very cold, followed by a heavy snow. Our water supply began to diminish at once and by night we had scarcely a drop of water coming into the battery. The heavy fall of snow with the light flow of water made the flow sluggish and finally stopped it entirely. Then began a struggle to keep the eggs alive until I could get orders from you where to transfer them. This was done by the men working in relays dipping the water from the re-

Digitized by Google

taining tanks and pouring it into the upper battery trough. This was continued 36 hours, when I received orders to transfer the eggs to Union City Hatchery. This meant quite a heavy loss of eggs, but we have the satisfaction of knowing we saved some of them. I should say I would have returned the eggs to the Erie Station, from where they had been shipped, only that every jar there was filled and it was impossible for the Superintendent to take care of them.

The drought has continued from that time up to the present and has caused untold damage to the surrounding country. Wells and springs that was never known to go dry in the history of the oldest families are dry and have been so for months. Conneaut Lake, the largest inland body of water in Pennsylvania, is at the lowest mark ever known. The fall of rain in this section of the State for the past year has been the lightest ever known in the history of the Weather Bureau. To-day we have no water at all in the stream on which the battery is located, a stream which two years ago would fill an eight-inch water pipe at any time of the year, and as we only require a four-inch main we had an ample supply.

As the drought still continued into this fall's hatching season it will again reduce my output considerably. The first two years I was located here we had two extremely wet seasons and these followed by two just as dry ones, it seems as though next year we should have plenty of water. We have had, however, a plentiful supply of water for our pond cultural work, and unless the ice freezes to a great depth to still lower the level of the lake, I see no reason for alarm in that direction.

On the opening of spring there is always a great deal of cleaning up to be done, such as giving the lawn a thorough raking, removing the refuse taken from the ponds during the winter, filling in the holes in the driveways and repairing fences.

As soon as the weather permitted, acting under your orders, I began a drainage ditch across the Mellon farm adjoining us on the north. This ditch is four feet wide on the top, two and one-half on the bottom, and runs a distance of 1,380, feet with an average depth of three feet. The time required to complete it was three weeks with five men's labor. The necessity for digging this ditch was caused from the fact that we secure our water supply for pond culture by damming up the outlet of the lake. In order to keep the water at the height required for use in ponds it was necessary to re-dyke along the creek to prevent overflowing this farm. This, of course, stopped the natural drainage of the farm in that direction and in order to prevent all the surface water from passing on to our grounds, this ditch was much needed.

As soon as this piece of work was finished, we began the work in earnest of building our new bass pond. This was a mighty job. During the winter we had cut all timber and removed all the logs found on the surface. The first thing we had to do was to get rid of the stumps and brush. There being a great number of stumps, and all green ones, the task was no light one. With the aid of dynamite, ropes, tackle blocks and horses we gradually got the ground in working condition ready to begin digging. In the meantime we had attended to fish cultural duties, the rearing and shipping of bass and sunfish and other things that demanded immediate attention.

Digitized by Google

Small Mouth Bass.

This season's work produced another new problem to which I have not found an explanation to my satisfaction. After all the nests had been set in the pond in the early part of June, I had at one time 15 nests with eggs on when first cast, and for two days after they were in first-class condition, but on the morning of the third day, on my regular inspection of the pond, I found that some of the fish had left the nest and nearly all of the eggs were dead. On going further I found some fish on the nests with the eggs in the same condition. This continued until 13 of the 15 nests died entirely. I, at that time, could find no reason for this, nor am I satisfied in my own mind at this time what was the cause. The matter was brought up to the Superintendent's meeting, held at this place July 7th. The opinion of one of the Superintendents was that the fish were too poor and had no vitality. This does not hold good in my mind, for within a week after this occurrence I had 23 nests of the same species and in the same pond where they had always been. Each and every one of these nests produced a fine percentage of fry, enabling me to rear and ship 69,500, and every one a fingerling.

We had no hard storms at that time of any kind, neither was there any sudden fall in the temperature. All of my bass at this time had been fed nothing but natural food, such as shiners and young suckers, as I had not been able to get my fish to take artificial food until some time later. At the time I thought it was the age of the fish. The fish I had must have been six or seven years old, and while I have no standard to go by as to the length of time before the males and females of the bass family began to deteriorate, this we do know that in some other species propagated fish of that age are useless. I have no reason not to believe that this would not follow with the bass family. Sufficient to say I lost the eggs and don't know why. Notwithstanding this set-back, I nearly doubled my output over that of last year. Number hatched and planted, 69,500.

Sunfish.

With the sunfish we had a fairly good year. The area of this pond being next to the smallest of the four ponds holding adult fish, I consider the output of 76,900 very fair. While not quite up to last year's production, I have no reason to complain of the number hatched. Our stock of adult fish being somewhat reduced by the natural mortality that comes to pond culture, I think we have done as well this year as we did last. It is a pleasure to propagate this species of fish, for they are busy little fellows and the fry is fine to handle and ship. I am waiting the time when we will have a much larger pond to devote to this fish. Aside from the bass there is no fish I take a greater interest in than the blue-gill sunfish. Number hatched and planted, 76,900.

Yellow Perch.

The number of eggs gathered this year from the yellow perch held at this station was way beyond my expectations. They gave us about 16,500,000 eggs. I tried a new experiment this year in brushing the pond. In addition to placing brush around the edge of the pond from the bank out, I cut smaller branches and placed directly on the bot-

Digitized by Google

tom in an upright position, bringing to the surface like those placed in the edge of the bank. I conceived my idea from a slight incident of the year before. A small piece of brush had become fastened to the bottom of the pond and from this brush I took five different strings of eggs. This set me to thinking it would be a good plan to put more in the same position. It did not prove much good, however, as very few strings of eggs were found on them, and the most of those we did find I think had become loosened from the ones set in the bank. The eggs received from the field shipped from the Wayne County Hatchery were the finest I ever saw, and I wish to commend the Superintendent of that station for his skill in gathering, packing and shipping these eggs.

At the adjourned meeting of the American Fisheries Society held at the Castalia Club, Castalia, Ohio, it comes to my mind that some of the different Superintendents of the United States Bureau of Fisheries gathered there found a great deal of fault in the handling of the eggs and fry of this fish. Some claimed they could not keep the eggs in the jars, others were bothered by the fry smothering. I have neither of these difficulties, nor have I heard of any of our Superintendents say that they had. Perhaps if they would screen the mouth of the jars and increase the flow of water at the proper time, they could eliminate this. Number hatched and planted, 33,700,000.

Pickerel.

These eggs came at the same time and from the same field that the yellow perch did. In quality they were equally as good as the yellow perch. There is a peculiar feature attached to the eggs of the pickerel and yellow perch. They are so nearly identical in color, size and formation that only an expert can distinguish the difference. The fish also have the same spawning period, and as near as I can learn, about the same habits. In color and size the fish are vastly different. In the propagation of this specie the period of incubation and the manner of hatching is the same as the yellow perch, and the per cent. of natural impregnation appears to be as great as the above-named fish, and we all know this to be nearly one hundred per cent. Number hatched and planted, 13,950,000.

Catfish.

The species of catfish propagated at this station are two in number, namely, Lake Erie catfish and the yellow or mud catfish. The first named fish is a very valuable one, its commercial rating being equal, if not better, than any other fish of this family. The number of adults held in the pond at present is not very great. We have only 12, ranging in weight from six to twenty pounds each. There is also held in this pond about fifty adult yellow catfish. These we had on hand prior to our getting the larger and better fish. We, therefore, had to have both kinds in the same pond, but, as far as I could observe, they seem to get along all right together. Each appeared to keep apart from the other. The majority of our Lake Erie catfish were received too late to do us any good this year. I am looking forward to getting a number more of this same kind of fish, and that eventually our Lake Erie catfish will be considered among the important fishes propagated at this hatchery. Number hatched and planted, 31,500.

Digitized by Google

Frogs.

Frog culture at this hatchery for the year just passed has been one of success. Not that anything new has been determined, only that I am firmly convinced that young frogs, say those that have reached the hopping stage, by that I mean the tail has become nearly absorbed, can get along with very little water.

In my report to you last year I mentioned the low condition of the water supply in the frog ponds. This was during August and September. I found at that time my frogs were gifted with a new instinct. Having this in mind, when the water conditions were about the same as last year, I began watching the young frogs. There was only about an inch or an inch and a half of water in the pond. In the early morning or evening the bottom would be covered with these little green fellows. During the middle of the day, at the hottest time, the majority of them would disappear. Then you could raise up the overhanging grass that lines the edges of the pond and find little round holes from an inch and a half to two inches in diameter. These sometimes ran straight back into the banks, and at other times would run parallel with the pond. In these little holes you would find the frogs packed in like sardines in a box. They were all in a healthy condition and from the increase in our output of this year over that of last, you can see we had no great loss.

Don't understand me as being an advocate of frog culture without water. What I wish to show is, that in case a leak should occur in a frog pond and be unnoticed and the pond become practically dry, they could get along for some little time without any water. Number hatched and shipped, 83,000.

New Bass Pond.

Without boasting, I believe we have at this station as fine a constructed bass pond as there is in the United States. It is somewhat irregular in shape and contains nearly two acres. It lies just below to the south of the hatching house, and runs parallel with the shape of the grounds. Its length from upper end to lower end is 420 feet; its greatest width at lower end is 235 feet. The east bank follows the contour of the creek to the lower end, then straight across to the western bank, then northward to the hatching house. The west bank of this pond answers a double purpose as a bank, and as driveway to the new dwelling house. The upper end of the pond is rounding in shape. Owing to the great width of the pond a double set of overflows was provided, each four feet wide and 12 feet long. The spawning area of this pond is practically the whole of it. The bottom has a gradual slope from about ten inches of water at the inflow to three feet eight inches at the overflow. This is the only thing I am at all disappointed in. I should have very much liked to have had at least five feet of water at lower end, but with the present height of water that we are able to carry we could not get it. I excavated as low as we could possibly draw the pond whenever we wished to clean out, or for any other reason than the pond should be drawn down. The length of time required to build this pond was three months and five days. The average number of men employed was five; that did not include the hatchery force. Number of teams, two, one of which was our own. Number of cubic yards of earth removed, 9,139. Cost of building this pond was $829.05.

Digitized by Google

All the banks were nearly finished for grading except the south, which I find will need a little raising. I am not just prepared to say what the capacity of this pond will be for spawning fish, but I think we can safely carry at least one hundred and twenty-five females and one hundred males. This pond should increase our output of bass from one-half to three-quarters of a million. With three or four more ponds corresponding in size with this one just built, I shall feel we have quite a bass hatchery.

New Dwelling House.

For the past two years it has been our aim to erect the second dwelling house at this station. On your official visit here in June a site was selected for this house. It is situated about seven hundred feet south of the hatchery building on the extreme western line of the grounds and faces the east. It is a fine two-story frame building containing five rooms. It has front and rear porch and has extra large windows in all the lower rooms. The cellar is under the entire house except the kitchen. The interior is finished in A No. 1 white wood and painted white. The kitchen is provided with stationary cupboard and sink. The purpose of the house is to provide for one of the regular men to be on the grounds at all times within call of the Superintendent. Taken as a whole it is a well-built house and finished strictly according to the contract. Original cost of house as per contract, $775.00, but some slight changes being made in the kitchen added $16.25 to the cost, making a total of $791.25.

Ice House.

In compliance with your orders we have erected an ice house 14 by 20 feet with 12-foot posts. This is located at the southeast corner of the new bass pond. Owing to being called into field work this fall, we were late in getting this building started, but we have it ready at this time to receive ice whenever it comes. This is a very substantial little building, being constructed entirely of hardwood lumber. The sills are eight inches square and the studding 16 inches apart. The roof is of amities roofing paper. This building will fill a much-needed want, as ice is very necessary at certain times of the year.

Improvements to the Grounds.

The most noticeable change toward the improvement of the grounds was the laying of a large sewer consisting of four 10-inch sewer pipes a distance of 286 feet, and the filling up of an unsightly ditch. This ditch virtually divided the grounds into two parts. It ran directly across the grounds from one side to the other. The elimination of this has been my desire for some time, and the accomplishment of it has given me a great deal of satisfaction. In addition to this there has been laid a temporary sewer 100 feet in length, 10 inches in circumference, running lengthwise with the frog pond. This is to assist in carrying off the water during the spring and fall. At the lower end of the new bass pond there is a ditch running at right angles with the pond a length of 260 feet, and extending through and under the new driveway. This connects by a ditch with the last-named sewer. The overflow of the new bass pond also connect with this ditch, which at some time in the future will be laid with tile and be entirely covered.

Digitized by Google

As I mentioned before, the dirt from the new pond was used to still further complete the grading of the upper end of the grounds. We have taken for our grade the established line of the western bank of the yellow perch pond, and are carrying this line stright through eastward to the bank of Conneaut Lake outlet. This is very nearly finished and with our team it will not require more than one week's work next spring. When this is finished we will have raised the original level of the ground three feet, with a good drainage provided across upper end and east side. Our greatest amount of work in grading came at the northwest corner of the grounds. In some places the fill was five feet and took hundreds of loads of dirt. Of course, this will settle some, but with very little work next spring will be finished and ready for seeding.

Some little time was spent hauling in dirt and grading the yard at the new dwelling house. We also constructed a roadway from the lower southwest corner of new pond to this house. This connects with the west bank of pond, making a continuous driveway from hatching house to new house. The strip of ground lying between east bank of new pond and Conneaut Lake outlet has had all the low places filled in, bringing it to the same height as the ground at the head of the new pond. In some places this required a three-foot fill. The outlet in one or two places had cut into the bank considerably, and these have been refilled, making the banks a little more uniform. This had all been done with less expense this year on account of digging the new pond.

Water Mains.

In connection with the new pond it was necessary to lay a separate water main for its maintenance alone. In order to insure a good clean flow of water it compelled us to start from our intake sluice from upper end of grounds, and from there a straight line to the head of new pond. This gives us water direct from the outlet without its passing through any other pond. Live water was needed for the reason of the great surface of this pond. Length of main 516 feet, diameter eight inches. We had some trouble with our water connection to upper fry pond heretofore, for the reason that part of the distance it was simply an open ditch. To overcome this we laid a six-inch wooden box from intake sluice to upper end of number one fry pond, a distance of 75 feet.

Number of Ponds and Their Use.

The number of ponds at this station are 10.
No. 1 is 75 by 225 feet, and is used for large mouth bass.
No. 2 is 60 by 225 feet, and contains sunfish.
No. 3 is 85 by 225 feet, and is devoted to yellow perch.
No. 4 is 80 by 80 feet, and is for catfish.
No. 5 is 420 by 235 feet, for small mouth bass.
No. 1 fry pond, 160 by 70, for rearing bass fry.
No. 2 fry pond, 30 by 80 feet, for sunfish fry.
No. 3 fry pond, 30 by 80 feet, for catfish fry.
Nos. 1 and 2 frog ponds, both 30 by 50 feet.

Digitized by Google

Field Work.

Acting under your orders I co-operated with Mr. P. H. Hartman, Superintendent of Erie Hatchery, in the white fish and Jumbo herring work this fall. I left here the 11th of November for Erie. After a conference with Mr. Hartman, it was thought best I take charge of the work at Port Stanley, Ontario. Securing the spawntakers at Erie we left on the evening of the same day for Conneaut Harbor. We crossed Lake Erie on the Marquette and Bessemer Steamer No. 2, arriving at Port Stanley on the morning of the 12th. After making arrangements for board and lodging, I at once interviewed the captains of the various tugs in regard to our taking eggs. I found them all in hearty accord with the work, ready to give all the assistance possible. We got there a trifle early as the females were all pretty hard, but within a few days after two or three small storms, the temperature took a sudden drop and the eggs began to come.

The heavy rush of eggs was very short, only lasting about five days, dropping off as sudden as it began. I wish to especially thank Captain Berry, of the tug Hattie Berry, and Captain Brown, of the tug Gordon Brown, for their kindness and assistance in every way toward the Department and myself in the gathering of the eggs. Mr. Hartman, of Erie, should also be commended for the advance arrangements for the transportation of the men and eggs back and forth on the car transfer, and for many other things that went toward making the successful beginning and ending of the work. I gave my personal attention to the handling and shipping of the eggs from Port Stanley to Erie, and their condition while in the field looked to be first class and should give a fine percentage of fry. There is a nice little fleet of tugs fishing out of this port, and with a few more spawntakers another season there is no reason why we should not get a large number of eggs. This year the number of men available was only enough to man two boats. The number of eggs gathered was pretty fair. Total number taken, 23,937,000.

Recommendations.

As the development of the grounds continues from year to year, the question of a different arrangement for our water supply for pond culture becomes more apparent. As things now stand we depend entirely on our dam for the distribution of the water to our different ponds. We hold it at all times at the highest point possible, and the depth of water in the ponds has never been satisfactory to me. I see no other way to overcome this only by laying a supply pipe from the mouth of Conneaut Lake to the upper end of grounds. This, I judge, would be a distance of about a mile. It is by all means the most important thing needed now. The natural fall of the ground from the mouth of the lake to the head of our grounds is something like six or seven feet and it would enable us to greatly increase the depth of water in our ponds. The expense of buying and laying this pipe would be considerable, but I am sure we would be greatly benefited

Digitized by Google

thereby. The future development of the ground demand that some other different arrangement will have to be made sooner or later, and I cannot recommend this too strongly to you for consideration.

In closing my report to you please find a tabulated statement of all the fish shipped and the counties receiving them. All of which is respectfully submitted.

Very respectfully yours,

W. H. SAFFORD.

Small Mouth Bass.

Armstrong county,	10,000
Allegheny county,	1,500
Beaver county,	1,000
Butler county,	4,000
Clarion county,	1,000
Crawford county (including Conneaut Lake),	10,000
Green county,	8,500
Indiana county,	7,800
Lawrence county,	2,000
Mercer county,	8,600
Somerset county,	1,000
Venango county,	9,600
Huntingdon county,	4,500
Total,	69,500

Wall-eyed Pike.

Armstrong county,	2,000,000
Crawford county (including Conneaut Lake),	17,200,000
Clearfield county,	100,000
Lawrence county,	400,000
Venango county,	200,000
Erie county (Lake Erie),	23,475,000
Total,	43,475,000

Sunfish.

Armstrong county,	8,000
Allegheny county,	1,000
Beaver county,	2,000
Crawford county,	32,900
Erie county,	1,500
Green county,	3,000
Clarion county,	3,000
Jefferson county,	3,500
Lawrence county,	2,000
Mercer county,	18,000
Venango county,	2,000
Total,	76,900

Digitized by Google

Pickerel.

Allegheny county,	500,000
Beaver county,	250,000
Crawford county (including Conneaut Lake),	6,550,000
Clarion county,	50,000
Erie county (including Lake Erie),	5,150,000
Green county,	100,000
Mercer county,	1,100,000
Venango county,	250,000
Total,	13,950,000

Yellow Perch.

Armstrong county,	375,000
Allegheny county,	750,000
Beaver county,	750,000
Erie county (including Lake Erie),	15,425,000
Crawford county (including Conneaut Lake),	12,100,000
Clarion county,	225,000
Indiana county,	225,000
Jefferson county,	300,000
Mercer county,	2,925,000
Venango county,	325,000
Total,	33,700,000

Catfish.

Allegheny county,	4,400
Armstrong county,	8,000
Beaver county,	2,400
Crawford county,	2,000
Green county,	1,000
Jefferson county,	8,000
Mercer county,	5,700
Total,	31,500

Frogs.

Butler county,	2,000
Crawford county (including Conneaut Lake),	16,000
Elk county,	12,000
Green county,	1,000
Lawrence county,	1,000
Mercer county,	24,000
Venango county,	5,000
Warren county,	22,000
Total,	83,000

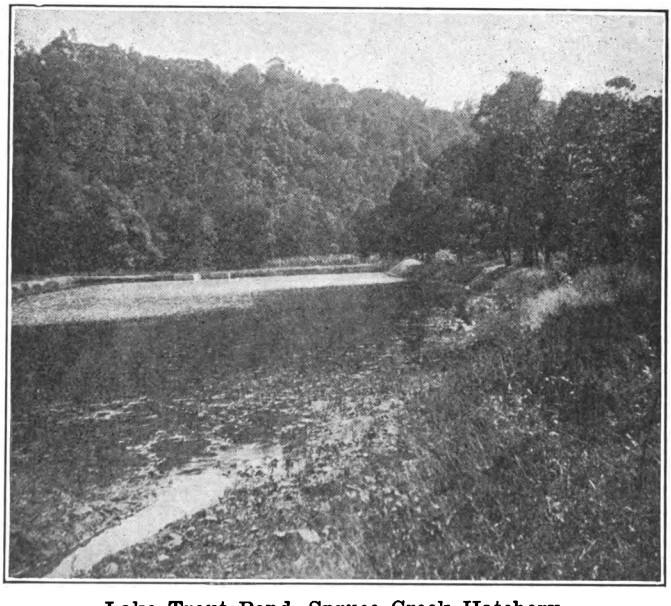
Digitized by Google

Summary.

Wall-eyed pike,	43,475,000
Yellow perch,	33,700,000
Pickerel,	13,950,000
Bass,	69,500
Sunfish,	76,900
Catfish,	31,500
Frogs,	83,000
Grand total,	91,385,900

Digitized by Google

Digitized by Google



Lake Trout Pond, Spruce Creek Hatchery.

Digitized by Google

SPRUCE CREEK HATCHERY STATION NO. 8.

Report of Wm. F. Haas, Superintendent.

Spruce Creek, Pa., December 18, 1909.

Hon. W. E. Meehan, Commissioner of Fisheries, Harrisburg, Pa.

Sir: The following is my report of the work of the Spruce Creek Hatchery from December 1, 1908, to November 30, 1909, inclusive:

During the year I hatched and distributed 585,625 fish, of which 510,325 were brook trout, 19,000 small mouth bass, 50,000 sunfish, 6,300 catfish. The total is nearly 200,000 less than in 1908, but that was because I received less trout eggs from outside sources. The stock in the hatchery was at the time not old enough to yield many eggs.

The pond in which the small mouth bass are kept is not suitable for their propagation and I hardly expected to raise any, but seven occupied the nests and Lydell boxes and reared a few bass, an eighth gouged a hole in the mud and raised a few fish.

No attention was given the sunfish because, first, the pond in which they were is not a very good type, and, second, the species is not the one which you desire to make a specialty of. Under the circumstances the output of 50,000 may be considered as large and a good proof of the wonderful power the fish has of increasing its kind.

I hatched nearly twice as many catfish than I was able to distribute. Soon after the fish spawned a great quantity of algae got into the pond and so choked it that many thousand young catfish were smothered and killed in removing them.

I had 850,000 trout eggs last winter, of which 250,000 were received from the Weissport fish hatchery as a gift, the remainder were from my own fish. The Weissport eggs contained a great many ringers and there were otherwise a considerable loss, so that the output of 510,000 No. 1 fingerlings seems to be a pretty fair percentage. There were 325 adults distributed.

The young trout, after the sac was absorbed did well until the 10th of February, when they began to display uneasiness and commenced to die. I tried every known remedy but could do little more than check the progress of the trouble. I therefore began shipping as what was needed was the rapid running water of the streams. My distribution was all over before the first of April. I was troubled throughout the winter by the greasy like algae from the spring, but not to the same extent as the year before.

As soon as spring opened I began the construction of a trout pond 400 feet long, 135 feet wide at the lower end and tapering to about 10 feet at the inlet, but with a full width of about 125 feet. It was completed in August and has a depth of four feet at the lower end and about one foot at the upper end. This is not deep enough and next summer I shall have to draw the water off and deepen the

Digitized by Google

entire bottom, excepting at the kettle, to insure an ample supply of water. I connected the pond and Spruce Creek with a ten-inch pipe, but beyond filling the reservoir I did not draw the water from that source but from the spring, having made an inflow on the left side to the inlet. This pond is designed for the lake trout and old brook trout.

Before the completion of the large trout pond, I began the construction of a number of smaller trout ponds and by the first of December had finished seven, averaging each 60 feet long and 22 feet wide and with a water depth of from three to three and a half feet. In addition I graveled the bottoms of three other ponds of the same size which I had nearly finished, so that now I have, not counting the large pond, 26 nursery and adult trout ponds. These ponds on the first of December contained about 1,400 four-year olds and over, besides lake trout and brown trout. Of three year olds 2,000, of two year olds 6,000 and 45,000 yearlings, and in addition 2,000 two year old lake trout, 2,000 yearlings, 1,500 yearling brown trout and about 7,000 silver side salmon nine months old.

The new ponds were built the same as those already on the grounds with board sides. It was necessary to do this on account of the small amount of money available and the necessity of having as many ponds as possible to accommodate the large stock of yearling fish.

In October it was decided necessary to draw off the water of the bass pond and the adjoining fry ponds in order that they might be cleaned out. The bass and other fishes in them were transferred temporarily to the lake trout pond and the water then drawn off.

About this time the owner of a grist mill below the hatchery who had water rights over a raceway claimed that the hatchery was about to use water from Spruce Creek to his injury sought to secure an injunction and began a suit in equity to that effect. You placed the matter in the hands of the Attorney General, who assigned a lawyer, and the case came up in the Huntingdon County Court, but neither the jurisdiction of the court nor the case has yet been settled, as far as I know of.

I constructed a new ice house on the piece of ground below the lake trout pond. The building is 14 feet wide, 22 feet long and 12 feet high and is ample for all the needs of the hatchery. In October we started the construction of a dam near the outlet of the spring run primarily to furnish water power to operate the meat grinding machine, with also the further object of using it for fish and to supply the extreme lower end of the grounds with water for trout ponds. When completed it will be elbow shaped about 350 or 400 feet long, 100 feet at the widest part and five and a half feet deep at the breast. It will not be possible to complete this pond or reservoir until next summer, but when finished will hold an incredible number of fish, more than all the place put together, excepting the lake trout pond.

During the very low water in Spruce creek I discovered one day two springs on the left bank at the upper end of the hatchery grounds which apparently flowed each about a two-inch pipe of water. The direction of the flow was evidently southwest. I therefore started a trench on the inside of the dyke, but when egg taking time arrived I had not completed it nor found the source of the spring. I believe,

Digitized by Google

however, that the most of it comes from a spring close upon the line of Mr. Isett's property, in which case we will be able to gather and utilize it and it will probably furnish a good supply for the lake trout pond.

Later we found wherever we dug holes northeast of the dyke that water was found leeching therein at a depth of two feet in quantities ranging from one to three quarts per minute. This led me to dig a short trench along the line of the driveway on the higher grounds, and before proceeding very far I found a good spring discharging more than a two-inch pipe of water, which has held up ever since. I believe that by continuing the trench we will find a much larger supply, perhaps enough to operate another hatching house as well as furnish an abundant supply of water for the lake trout pond without utilizing either the creek or the other spring water. My belief in the existence of this new spring is based not only on what I have already found, but on the fact that nearly a quarter of an acre of ground between the highland and the dyke is nothing but a swamp and wet throughout the past summer and wherever we dig at a depth of about two feet we come upon water in small quantities which never fails.

Last year a driveway was designed from the upper end of the grounds, crossing over to the east hillside and downward among the ponds and at the lower end of the lake trout pond, crossing towards Spruce creek and down to the lower end of the property. At intervals I graded and macadamized about 200 feet of this driveway, making over 500 feet now either graded or paved. I also graded the grounds around the older ponds and sodded them and planted willows along the top of the dyke.

The trout this fall ripened later than usual and indeed we had scarcely taken any eggs when I was ordered to the Weissport commercial hatchery to take surplus eggs guaranteed by the owner, Mr. Wolters, for the use of the hatchery. I secured at Weissport 1,300,000 eggs, and from my own fish took 1,500,000. I also received 500,000 from the Paradise Brook Trout Company, where Mr. Nathan Buller, Superintendent of the Wayne hatchery, had been sent to take the surplus eggs. This makes altogether a total of 3,300,000 eggs more than we ever had in the hatchery before.

At the time of writing this report all the eggs are doing well excepting those received from Monroe county. These eggs contain many ringers and, probably through having been retained too long before shipping, many dead eggs.

The great drought effected the spring, reducing the supply about 500 gallons a minute, but as the regular supply is about 2,000, the loss was not felt. I am also glad to say that there is even less of the greasy substance in the water than last year.

In November a contract was awarded to James Baird for the construction of an addition to the dwelling house. On the thirtieth of November it was not completed. I also dug a well to supply water for the assistant's house. A good supply was found at 14 feet.

Digitized by Google

The following is the output of fish in detail:

Brook Trout.

Blair county,	22,500
Bedford county,	24,000
Cambria county,	58,500
Franklin county,	30,000
Fulton county,	15,000
Huntingdon county,	10,500
Indiana county,	10,500
Juniata county,	7,500
Mifflin county,	155,500
Perry county,	26,000
York county,	150,000
Total,	510,000

Adult Brook Trout.

Cambria county,	125
Huntingdon county,	100
York county,	100
Total,	325

Small Mouth Black Bass.

Blair county,	3,000
Cambria county,	10,000
Huntingdon county,	6,000
Total,	19,000

Sunfish.

Allegheny county,	10,000
Lancaster county,	40,000
Total,	50,000

Catfish.

Cambria county,	4,200
Huntingdon county,	2,100
Total,	6,300

Summary.

Brook trout,	510,325
Small mouth black bass,	19,000
Sunfish,	50,000
Catfish,	6,300
Total,	585,625

The above is respectfully submitted.

WM. F. HAAS,
Superintendent.

Digitized by Google

OPERATIONS OF THE COMMODORE PERRY.

Report of Captain J. R. Driscoll.

Honorable W. E. Meehan, Commissioner of Fisheries,

Harrisburg, Penna.

Dear Sir: I take pleasure in submitting to you my first annual report as Master of the Patrol Steamer "Commodore Perry."

Myself and crew completed laying up December 31, 1908. We laid up in the manner termed in marine circles as laying up and fitting out, having the boat in such shape that on receiving notice on the 12th of March, 1909, to fit out at once, we had steam up and ready for navigation in the short time of eight hours.

From March 19th on continuously for 31 days we were busy planting fish, making from two to three trips daily and from two to three drayloads each trip. Acting under instructions from Superintendent of Erie Hatchery we went quite well into the lake. We planted the fish miles apart, scattering them over a large area. I am sorry to say that for lack of funds for running and maintenance I received orders to lay up the vessel again on April 23. We lay idle from April 23rd to June 1st, at which time the appropriation for the next two years became available.

June 6th we planted the last load of blue pike from the Erie Hatchery. At various times throughout the summer shipments of black bass and frogs were taken aboard; bass were planted along the north shore of Presque Isle Bay, and frogs were carried to the interior ponds in the Peninsula.

June 26th we began running to the pound nets collecting black bass and yellow perch, also all undersized sturgeon. On return of each trip all fish were promptly turned over to the Superintendent of Hatchery.

November 3rd I cleared for Port Dover, taking with us spawn takers and all implements used for the purpose of taking spawn. We were busy for 30 days transporting eggs back and forth from the pound net fishermen east of Port Dover and fetching to Erie over 40,000,000 of white fish in the very best of shape.

All water within the jurisdiction of Pennsylvania were steadily patrolled, and careful watch maintained at all times. We are pleased to say that in the year just passed there were no violations of any kind detected, and it is my candid opinion that there were no violations even attempted.

On several occasions while patroling or returning through the lake on other business I found lost nets. All that were found were ruined as far as fishing was concerned, there being nothing left of them except the side lines. In some cases a few leads or sinkers were still attached, but in most cases it was the lines or corks. If they were branded we always restored them to the owners.

Digitized by Google

At all times we carefully inspected the pound and trap nets along the shores to see if they had the required sized nets and to see that no trap nets were set within 17 miles of the harbor entrance.

On April 7th the fishing tug "George A. Floss," William E. Barry, captain and owner, with all his crew were lost six miles off of Cleveland, Ohio. Captain Barry, Captain John Daley and Mr. Frank Weschler were all Erie men.

On April 17th the Honorable John Hamberger telegraphed the Commissioner of Fisheries, asking permission for the use of the "Commodore Perry" to clear for Cleveland, Ohio, to assist in the search for the bodies of the ill-fated crew of the "George A. Floss." Permission was readily granted by the Commissioner of Fisheries. We cleared for Cleveland on the night of April 18th. R. P. Daley, brother of Captain John Daley, who was a member of the ill-fated crew, accompanied us and assisted in the search.

We arrived in the vicinity of the wreck on April 19th. We searched the lake for miles for three continuous days, but all in vain. I came to the conclusion that we were a little too early, being under the impression that the temperature of the water was too low to prevent the bodies coming to the surface. We returned to Erie on April 22nd. On the 29th of May we again cleared for Cleveland to resume the search after getting word that a passing steamer had sighted the body of a man floating near the vicinity of the wreckage of the "George A. Floss."

On the morning of May 31st we found the body of Captain John Daley. We took the body aboard and headed for Cleveland where it was turned over to the authorities. There was still one body missing, so we took up our search for another day and a half. We were not successful in locating it, but heard it had been picked up on the beach.

After our day's work on the 23rd of April, while seated at the supper table, word came to my house that the gasoline tug "Frank Weigand" was in distress and drifting helplessly with four men aboard at the mercy of the sea near the fishing grounds. Immediately upon receiving the news I got my crew together as quickly as possible and went out in search of them. Not knowing what course she was on it seemed a hopeless task at first as darkness had already settled over the water. After running into the lake about 8 miles on the nor' nor'west course we found we had fortunately taken the right course for we could faintly discern the hull of a boat in the distance, which upon closer approach proved to be the missing boat. We immediately made a line fast to her and towed her into harbor. We found on reaching shore that her engine was disabled.

On the afternoon of the same day and during a heavy wind storm the gasoline tug "William Schau" was disabled and at the mercy of the sea. We went to her assistance and passed a line and towed her into the harbor.

On the night of August 15th a severe storm came up and word came to me at 9 P. M. that two fishermen, Frank Phinney and John Lamb, were still on the lake, not having returned from the fishing grounds. Being in an open boat much fear was felt for their safety. We went out to where they were supposed to have their nets and searched for miles around, but no trace of them could be found.

Digitized by Google

We came home satisfied in our minds that if they had not reached the Canadian shore they were lost. The next day word was received at their homes that they had safely reached the Canadian shore, much to the surprise of everyone at the water front.

On October 12th the gasoline boat M. N. & N. N. became disabled just outside of the breakwaters and drifted ashore. We went to her assistance, passed a line with the aid of the U. S. Life Saving crew from the tug to the Perry. We began to pull on her and moved her probably five to ten feet, but the seas were so heavy and she was so fast that the tow line parted and the boat filled with water, and it was useless to make further attempts to pull her off at that time. She gradually drifted so near the beach that a week or so after they hauled her out and dismantled her.

On the night of December 7th the Carferry "The Bessemer and Marquette No. 2" plying between Conneaut, Ohio, and Port Stanley, Ont., sank somewhere west of Erie. The exact location of the wreck is at present unknown.

On Friday evening, December 10th, word came to Erie that the ferry was not lying under the lee of Long Point as was at first supposed. Immediately on the morning of the 11th I started out in search of her or any wreckage to convince ourselves of her safety or loss. After running about 18 miles into the lake on the north course we run into several pieces of wreckage which we immediately recognized as coming from the carferry. We made further search in hopes of finding some of the bodies or her lifeboats. We searched until dark but nothing more was seen that day.

As Mr. Albert Weiss, Treasurer of the Keystone Fish Company of Erie, Pa., was aboard the boat at the time, they requested that some of the boats go out in search of the ferry or her crew. I immediately consented to go and started out on Sunday morning, December 12th, taking the north by east course. After running 15 miles into the lake I passed some more wreckage. We began to trace this wreckage up, and after running about 20 minutes we sighted a dark object in the distance. Upon near approach we found it to be a lifeboat, and upon drawing alongside of it we saw that it contained the forms of men. On closer examination we found they were all dead, and began counting the bodies and found at the time that there were eight bodies in the boat. As the boat was filled with water and a high sea running at the time, this was no small task to make a line fast in order to tow her ashore. After getting the line fast to the boat and getting under way we were constantly in fear that we would roll the boat over and lose some of the bodies. We run under check, and by careful manoeuvering we landed the boat safely alongside the public dock, and immediately notified the coroner of our find.

On our way to the harbor we spoke to Captain Gilbert of the "J. H. Driscoll," and asked them to steam ahead with the news. On reaching the dock we found that the news had rapidly spread throughout the city and to Conneaut, the home port of the ill-fated ferry, of the finding of the bodies. Thousands of people were at the dock, eager to look upon the gruesome find.

Upon the arrival of the Coroner and upon taking the bodies out it was found that the boat contained nine dead men instead of eight as we had previously counted. But the body of Albert Weiss was not among them.

Digitized by Google

After the removal of the bodies from the life boat we bailed it out and hoisted it upon the dock. Souvenir fiends at once became busy cutting off lines, corks and other small things they could find.

Immediately following December 12th the weather became more severe and further search was made almost impossible. We tried for several days thereafter to make further search but each time were forced to return either owing to the high seas running at the time or to the driving snow storms which retarded our progress.

We were in hopes that toward the end of December that we might be able to make another search but real winter weather set in and covered the harbor with ice, making it impossible for us to get out again. We had also intended to assist the fishermen in recovering some of their nets they had lost in the storms of December. We may say that there were more nets lost off of Erie in the gales of December than had been lost in the previous 20 years. As you stated in your letter under date of December 15th we were to assist in the removal of these nets. I am sorry to say that we were unable to do anything, all owing to the bad weather as heretofore mentioned.

On the 26th of December we had about given up all hopes of getting into the lake again for this season, so began laying up and completed by December 31st.

As the Department of Fisheries have let the contract for the building of a dock for the use of the "Commodore Perry," and the water at present and each year becoming at a low ebb, I would earnestly request that the canal basin in which this dock is located be dredged. As the bottom is composed of rock this will have to be done by blasting and then cleared off. The appropriation will have to be a little larger for this purpose than if the bottom were composed of sand or any other substance.

I would further recommend that at some future time a steam net puller be provided for the tug to be used in lifting twine.

Hoping this report will meet with your approval, and thanking you for your kind and able assistance throughout the past summer, I remain,

Yours respectfully,
Captain JERRY A. DRISCOLL.

Digitized by Google

REPORT OF CHIEF WARDEN.

Harrisburg, Pa., December 1, 1909.

To the Board of Fishery Commission:

Gentlemen: I have the honor to herewith present my annual report as Chief Warden, the report covering a period of one year, beginning December 1, 1908, to December 1, 1909.

During this period of time there were 387 arrests made for violation of the fish laws, of which 336 were convicted and 17 went to jail in lieu of payment of fines. Thirty-seven of the above convicted appealed or certioraried to the County Courts, where the cases are still pending. Of the 387 arrests made during the year, 281 were made by the regular wardens. The total amount of fines imposed by magistrates for this period of time was $6,702.46, of which amount $4,561.46 was paid to the several magistrates. The balance of $2,141.00 constitute appealed cases and cases in which the defendants were elected to serve out the fines in jail. The following tables will show the legal work of the Department in detail:

TABLE NO. 1.

Statement of Legal Proceedings.

The following is a tabulated statement of the legal proceedings taken during the year, from December 1, 1908, to December 1, 1909:

Total number of arrests,	387
Total number of convictions,	336
Total number of acquittals,	50
Total number dismissed with costs,	1
Total number committed to jail,	17
Total number of fines imposed,	$6,702 46
Total number of fines paid,	$4,561 46
Total number of appealed cases,	37

Digitized by Google

TABLE NO. 2.

Work of Each Warden and Officer.

The following tables exhibit the work of each regular warden in detail:

Regular Wardens.

Name.	Arrests.	Convictions.	Acquittals.	Fines imposed.	Fines paid.	Jail.	Appeals.
J. W. Criswell,	25	23	2	$620 00	$345 00	------	8
C. N. Nesley,	37	36	1	560 00	350 00	2	4
E. H. Stephan,	29	28	1	490 00	315 00	------	6
W. E. Shoemaker,	28	22	6	340 00	240 00	------	------
C. R. Holland,	33	32	1	470 00	380 00	1	4
J. E. Conklin,	13	12	1	335 00	235 00	------	2
J. P. Albert,	8	6	2	240 00	240 00	------	------
M. F. Albert,	12	12	------	390 00	130 00	4	------
G. D. Shannon,	13	5	8	65 00	65 00	------	------
J. D. Sizer,	36	33	3	435 00	165 00	1	9
F. B. Whiteman,	37	31	6	535 00	390 00	1	3
Raymond Marcy,	4	2	2	25 00	----------	1	------
W. H. Steffner,	2	2	------	40 00	40 00	------	------
M. P. Maitland,	4	3	1	95 00	----------	1	------
Totals,	281	247	34	$4,640 00	$2,895 00	11	36

Special Wardens.

Name.	Arrests.	Convictions.	Acquittals.	Fines imposed.	Fines paid.	Jail.	Appeals.
W. S. Losh,	3	------	3	----------	----------	------	------
J. L. Sherwood,	6	6	------	$39 36	$39 36	------	------
Jos. Hoover,	1	1	------	25 00	----------	1	------
J. B. McCauley,	27	26	1	497 50	541 50	2	------
Hiram Brown,	6	6	------	100 00	100 00	------	------
H. E. Boda,	3	3	------	60 00	60 00	------	------
Wm. J. Acker,	6	2	4	45 00	45 00	------	------
David S. Hess,	1	------	------	----------	----------	------	------
George Spangler,	1	1	------	20 00	20 00	------	------
Wm. Shugart,	1	1	------	100 00	----------	------	------
Israel Davis,	3	------	3	----------	----------	------	------
Jas. E. Holland,	4	4	------	100 00	25 00	3	------
P. S. Skelly,	1	1	------	25 00	----------	------	------
John J. Carter,	1	1	------	20 00	20 00	------	------
Guiles L. Tompkins,	1	1	------	20 00	20 00	------	------
George Butler,	3	3	------	75 00	75 00	------	------
J. B. Smith,	2	2	------	50 00	50 00	------	------
Robert Wilson,	2	2	------	40 00	40 00	------	------
S. A. Moyer,	4	4	------	80 00	80 00	------	------
Total,	76	64	11	$1,296 86	$1,025 86	6	------

Digitized by Google

State Police and Constables.

	Arrests.	Convictions.	Acquittals.	Fines imposed.	Fines paid.
Forestry wardens,	2	2	------	$15 00	----------
Constables,	13	13	------	600 00	$490 00
State police,	15	10	5	150 00	150 00
Totals,	30	25	5	$765 00	$640 00

TABLE NO. 4.

Different Charges.

Dynamiting fish,	22
Catching short trout,	5
Catching short bass,	17
Catching game fish out of season,	14
Seining game fish,	3
Fishing fyke nets in trout streams,	4
Gigging or spearing in trout streams,	12
Gigging or spearing bass,	6
Selling trout,	2
Dipnets,	6
Fyke nets,	4
Stir nets,	1
Gill nets,	1
Seine nets,	22
Fishing with the hands,	2
Fishing with layout lines out of season,	8
Shooting fish,	1
Snaring fish,	10
Sunday fishing,	39
Fishing by drawing off waters,	19
Obstructing the migration of fish,	1
Illegal fish baskets,	118
Illegal devices not specified,	24
Polluting waters,	3
Interfering with an officer,	1
Dipnets in trout streams,	5
Refusing to assist warden,	1
Undersized pickerel,	10
Fish baskets in trout streams,	1
Fishing baskets on Sunday,	1
Fishing baskets without license,	2
Outline in trout stream,	1
Nets at dams,	1
Gigging out of season,	1
Outline with live bait,	1

Digitized by Google

During this period of time there were 15 regular wardens on the force, one of this number only doing duty as a warden a portion of the time owing to having been detached for field duty in the work of gathering spawn on the Delaware river and the lakes of northeastern Pennsylvania and Lake Erie about six months of the year.

It will no doubt be observed that the arrests during this period of time is somewhat less than the previous year, which may probably be accounted for for several causes, among them that in several sections of the state there oppeared to be a considerable decrease in violations, and owing to the fact that on the first day of May, 1909, the new fish code, being a codification of former laws with a variety of changes, went into effect.

For the first few months following the enactment of the new law we had considerable difficulty supplying demands for copies of the fish laws. The people therefore were not familiar with the requirements of the new code and it was deemed proper to withhold arrests except in the graver cases but simply confiscate the devices and instruct the operator in the requirements of the new law. During this period of time many illegal nets, which had been legal under the former laws, were confiscated and destroyed.

Simultaneously with the passage of the new act, all special warden's commissions became void and such wardens could only be reappointed under more restricted conditions which practically kept the amount of special wardens far below the number engaged for the previous year. The new act does not permit the special wardens to retain half the fines collected as his compensation, therefore the special warden has been less active during the present period of time than in previous years.

It will be observed that the Act of May 1, 1909, provides for the appointment of 30 regular fish wardens, but owing to a lack of sufficient appropriation for the payment of this amount, by careful calculating, it was ascertained that the amount available for payment of wardens would not permit the appointment of more than 10 at the salary fixed by the Act of Assembly. The State, however, has been apportioned into 30 districts in conformity with this Act of Assembly, 20 districts still remaining vacant until such appointments can be made. The regular wardens stationed in adjoining districts have patroled the several vacant districts as frequently as was possible to do after keeping down the violations in their immediate districts, thereby affording the vacant district partial protection, but the amount of streams to cover was found to be considerably more than should be alloted to any one warden to realize the best results and protection.

I am glad to report that the conduct of the regular wardens during the stated year has been good with few exceptions. During this period of time it became necessary to discharge one regular warden and suspend another, which suspension is still pending. The discharged warden was that of George D. Shannon, who was discharged on or about the first day of June, 1909, for drunkenness and disorderly conduct at Huntingdon, Pa., at which time he was arrested, committed and fined for which his discharge immediately followed.

The suspended warden is M. F. Albert, who was arrested and tried before the Court of Quarter Sessions of Allegheny County on the 19th of October, 1909, on two charges of extortion, the prosecutors

Digitized by Google

alleging that Warden Albert had extorted moneys from them in Butler county and that later had attempted to extort additional sums from the same fishermen in the city of Allegheny, whereupon he was convicted by the said Court of Quarter Sessions and sentenced to labor in the Allegheny County workhouse for a period of 60 days. On this conviction M. F. Albert was suspended from any further duty as a fish warden, which suspension is still pending.

At present the regular warden force consists of nine wardens, receiving a salary or compensation for their services. Three of the listed regular wardens—Raymond Marcy, W. T. Steffner and Charles F. Gehman, have volunteered their services without compensation until such time as there is a vacancy or available funds can be had.

THE NEW FISH CODE.

The Act of General Assembly, approved the first day of May, A. D. 1909, which has become generally known as the new fish code, a codification of all former fish laws, went into effect on the first day of May, 1909, at which time all former laws relating to fish and fishing, governing the interior waters of Pennsylvania, were repealed. The new code has in many ways been proven an improvement over former laws, yet there are still a few remaining provisions that are proving dissatisfactory to the extreme.

Section 2 of the new code seems to be one of the worst at fault in that it is too indefinite in its classification of devices permissable for the taking of different species of fish. The worst feature of this section no doubt, is that relative to the taking of food fish by the use of a seine net. While the section specifically designates the seine net as one of the devices permissable for the taking of food fish, neither this section nor any of the following sections plainly describes to what extent the seine net may be used other than for the taking of shad, herring and alewife during a specified legal season.

Section 5 of the same act further provides that other food fish except shad, herring and alewife may be kept if caught in such seine net while lawfully fishing for shad, herring and alewife. While there can be no question as to the intent and meaning of the law in regard to the use of such seine nets, the undefined enumeration of the seine net in Section 2 has a tendency to mislead many fishermen into the belief that the seine net may be used generally and at all times of the year for the taking of food fish, and this belief has raised considerable contention throughout the summer months by a general pouring in of applications for licenses to fish with seine nets for the commoner food fishes in the inter waters of the State.

I am glad to report also that with the repeal of the act of April 26, 1905, permitting a general use of seine nets after having given bonds, etc., one of the greatest and most destructive evils to fish life has been prohibited. Unrestricted operation of the seine net for the capture of the commoner food fishes during the period of time from 1905 to 1909 has done much in the way of reducing fish life, and more particularly the quantities of game fish in many streams

Digitized by Google

or waters of the State than perhaps any other one of the commoner devices. It is expected that the confining the use of the seine net to the taking of shad, herring and alewife only will do much towards restoring the normal supply of fish in the waters of this State by the way of natural propagation.

The several sections of the new code pertaining to the seasons at which the several species of game fish may be taken, also the size and number of fish that may be legally taken in any one day, seems to be meeting with general approval throughout the State. The new section pertaining to the use of what are commonly known as lay-out lines or set lines, prohibiting the use of such devices during the spring months, has also met with general approval in that during the prohibited period of time game fish eagerly bite at the device commonly known as the layout line, opens on the first of June at a period of time when game fish bite less frequently, the damage done by this device greatly diminished.

Section 4, permitting the use of fyke nets in numbers unlimited and increasing the season for such devices from six to eleven months, is meeting with some disapproval in that some of the food fishes in some of the waters of the State are bordering extinction from the fact that large numbers of these nets have been used.

The two greatest evils complained of legalized by the former fish laws of this Commonwealth, I regret to say, still remain in the new fish code, namely, permitting the use of a gig or spear in the waters of this Commonwealth, also the use of fish baskets. From reports gathered in the several sections of the State where taking fish by the use of the gig was most common, it appears that the season has been one of extreme destruction to fish life. While the gig ordinarily is a device that will take fish in large numbers, if in the hands of a skilfull operator, the conditions of the water throughout all the period of the year in which gigging was legal, from its extreme lowness, enabled the operator to take the last fish from practically any stream of water of ordinary depths, Many streams had become so low that there was only a small quantity of water flowing over the riffles from pool to pool, which compelled the fish to harbor in the little pools along the stream. Even the pools were so shallow that the fish had no means of escape and were readily picked up by any person following the stream with a spear.

Reports also substantiated the fact that gigging was generally participated in in all streams not inhabited by trout and occasionally even trout streams did not totally escape the fishermen operating gigs. Reports of dead game fish cut or marked by a gig evidently in the hands of some fishermen was common. Reports show that many large dead game fish cut or mangled by a gig have been found lying along the shores or floating on the waters of many of the larger streams in the State, both in the eastern and western streams. It is not definitely known whether these fish have been mistakenly struck with a gig and after the operator had discovered that the fish was of the species forbidden to be taken in that manner, that the fish was again returned to the stream or thrown on the bank, or whether the fish succeeded in freeing itself from the gig and escaped after which it died from its wounds. It is to be hoped that at the next session of the Legislature some law will be passed that will totally forbid the use of this device.

Digitized by Google

Section 8 of the new fish code, which was believed to be a more satisfactory but restricted law providing for the operation of fish baskets, has been proven to be little more desirable than the former laws in that with the additional restrictions placed upon the device, investigations show that the device has been used just as carelessly and with probably as destructive results as in former years.

The new fish code in its several more important provisions provides, first, that the basket shall not be placed or operated in a stream known as a trout stream and that the wingwalls shall not extend from main shore to main shore or occupy more than three-fourths of the width of the stream, or that the bottom of the basket shall be movable for the entire width of each and every fall or at least so much thereof as not to permit more than seven slats to be permanently nailed.

These several provisions were expected to remedy the main complaint of provisions, such as catching trout or obstructing small streams that would make it impossible for fish to ascend or descend the stream. Also to prevent the closing of the entire stream to both navigation and the migration of fish. The new provision requiring that the entire width of the bottoms must be removed from eight o'clock in the morning until four o'clock in the afternoon was expected to reduce the amount of small fish annually destroyed by falling upon the slats of the bottom of the basket or remain there and die, but the inspection of baskets throughout the season ended has conclusively shown that the operators of those baskets had little if any desire to comply with these provisions of the new law.

One hundred and eighteen arrests were made for the operation of illegal fish baskets. Possibly as many more could have been made on a closer enforcement of this law, but only the most aggravated cases were prosecuted. Among the aggravated conditions concerning the construction and operation of these baskets were the determined efforts made by many irresponsible basket fishermen to place and operate fish baskets in streams known to contain trout. Many of them succeeded in having the County Treasurer issue licenses for some point in a trout stream under the operator's statement that no trout were known to inhabit that particular portion or spot in the stream and by this means made every attempt to force the device into trout streams against the provisions of the law, raising for defense that they had already procured a license to operate a basket at that location.

Further, even though the law restricted the closing of the entire stream, fishermen would build the walls running almost to the edge of the water line and then pretend to evade the law under an interpretation that the furtherest point reached by the water at flood time was the boundaries of the shore.

That provision requiring that the bottom for the entire width of the basket should be removable and removed from eight o'clock in the morning until four o'clock in the afternoon was equally disregarded with the other provisions of the new law. Many baskets were found to contain the entire bottom solidly nailed fast with dead fish in the basket. Other baskets had only a few slats removable and removed. The majority of them contained at least half of the slats immovable and the destruction of fish life by this excessive

Digitized by Google

number of slats seems to be greater this year than probably any previous year owing to the fact that the waters have been very low and the volume of water pouring into a basket decreases the chances for the fish to escape through smaller openings in baskets. As the water flows through the basket about as fast at is comes into the rack or basket, the fish have no means whereby to swim about in a basket in search for an open place and consequently remain on the slats jumping about until they die, both from the effects of bruises and lack of water to sustain life.

Many baskets, particularly in the lower Susquehanna river, were found to contain large quantities of small dead shad lying on the slats. This increased destruction of little shad was undoubtedly due to a lack of sufficient water pouring on the slats to permit them to pass through readily with the current.

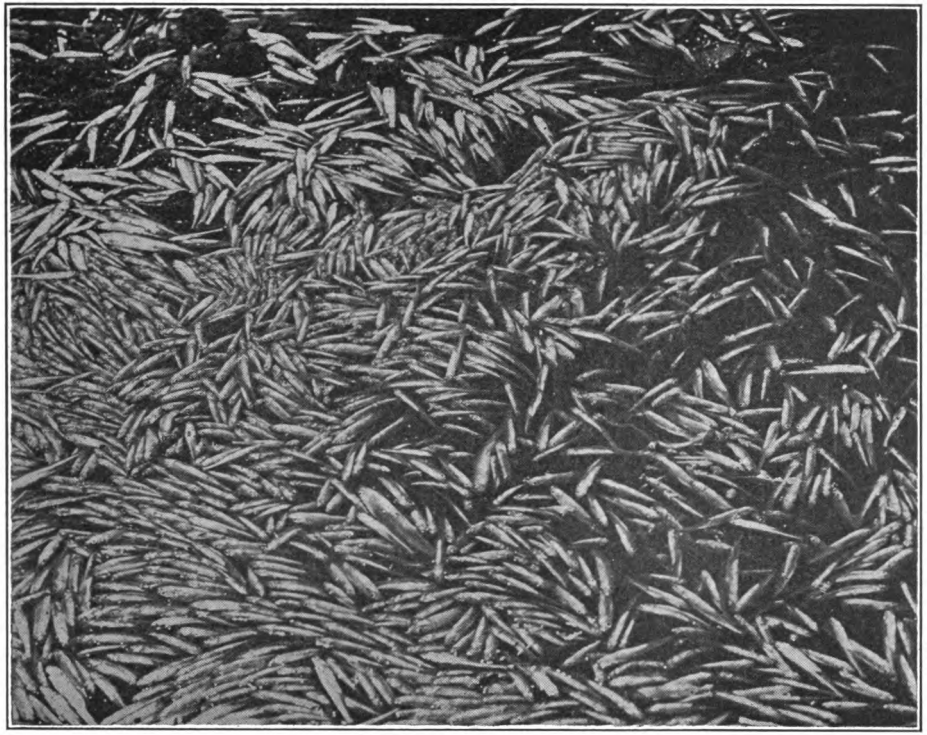
Upon being arrested, the defendant most invariably would in defense claim that he had followed the law closely enough and that any fish that wanted to, he thought, would be able to get out of his basket and that he was unable to comply with the law in its several provisions. The offense most invariably consisted of a violation of at least two or more provisions of the sections, thereby the wardens were amply prepared to prove good and strong cases against the defendants, who were convicted and compelled to pay the fine affixed by the Act of Assembly.

It has been observed that the great majority of these people were people in very moderate circumstances and that considerable difficulty was expressed in making up the several fines. To my personal knowledge I know of a number of families who were in destitute circumstances that were compelled to part with their scant savings for the winter in order to pay their fines. Experience enables me to say that it is useless to attempt to regulate the operation of fish baskets by restricted laws, for the operators of the baskets in the majority of cases will totally disregard them. It is therefore far better and I so earnestly advise that every effort be made to repeal the fish basket section in the session of the next Legislature and enact such laws as will prohibit the use of fish baskets entirely in any waters under the jurisdiction of Pennsylvania.

THE POLLUTION OF STREAMS.

Section 16 of the new fish code, which specifically forbids the pollution of streams by refuse known to be deleterious to fish life, has added a broad field of additional duties to the work of the Department of Fisheries. The demands for a law of this kind seems to have been general, and this section seems to meet with approval everywhere. Even the industries, though inconvenienced, temporarily at least, seem to approve of a law prohibiting pollution. In fact many streams of the State had become so badly polluted that many industries were compelled to filter the water before using it in their plants.

Digitized by Google



Fish Killed by Water Pollution, Lake Erie.

Digitized by Google

Digitized by Google

On assuming these duties, the Department was soon convinced that the great majority of the industries were ready and willing to co-operate, but while pollution was general, there were few known methods for its abatement and those were largely experimental. Upon this discovery, the Department deemed it advisable to join in the experimental work and aid the industry rather than to cripple it, and that suits should be brought only after the industry's refusal or neglect to endeavor to comply with the law.

Most invariably notice was given to the industry to abate the pollution, and such notice carried with it a specified time at which the pollution had to be discontinued. The time given largely depended on the nature of the pollution and the amount of time required to successfully complete it. Pollutions that could be abated with little inconvenience were stopped immediately or within a few days. In order to determine the nature of the pollution and the best methods to be employed in its abatement, a thorough knowledge of the material in solution is required.

This requisite has caused the Department to investigate as well as experiment, and although many of the investigations are still incomplete, much valuable knowledge has been gained. The term pollution as collectively used, covers an extensive list of different materials, either refused or unretained by the manufacturers, but as the list is most invariably chemical as well as mechanical, a chemical classification will no doubt be the more comprehensible. Then for convenience we will divide all matter into two classes; organic or inorganic. To these permit me to add another, poisonous gases. Though perhaps not technically correct, the subject is of sufficient importance to warrant a separate and distinct classification. Until recently the subject of gaseous pollution received little or no consideration, probably owing to the fact that gases generally are colorless, therefore not easily detected through the sense of sight.

While coarse suspended matter, though frequently much less injurious, causes the stream to look totally unfit for fish life, recent investigations have conclusively demonstrated that poisonous gases lead in the destruction of fish life, and that at least seven-tenths of all fish killed by pollution were killed by poisonous gases. The gases that are most prominent in the work of destruction are: Chlorine, hydrogen chloride, carbon monoxide and hydrogen sulphide. Chlorine is extensively used as a bleaching agent by manufacturers of paper and for bleaching cotton, wool or other fabric.

The method varies largely, according to the purpose for which it is to be used. It is used frequently as chlorine, though perhaps much more frequently as a chloride. The gas is very soluable in water, and when it escapes into a stream it is very injurious to fish life. The effect is more irritant than poisonous, chlorine directly attacks the gills of the fish, being its chief organ of respiration. The fish will frantically dash about in the water as if attempting to free itself from some object. It will rise to the surface, then disappear again. Fish suffering in this manner most invariably die from irritated gills, which decompose very rapidly after death of the fish.

Ammonia is frequently found in pollution from gas houses where coal gas is manufactured, being an unretained by-product. It is also frequently found in drainage from leaky ovens where it is collected as a by-product. In such cases it is usually an inferior

Digitized by Google

quality and it is intentionally turned into the sewer. Its action on fish is much like that of chlorine. Hydrogen sulphide is perhaps the most general and widely distributed of this group of gases. It is common in all waters from coal mines, in washings in the manufacture of water gas, in all blast furnaces where a gas washer is used, and from all sources of manufactury where sulphurous gases are conducted into water.

The effect of this gas upon fish differs slightly from the two former gases in that the fish become sluggish or stupified. They do not die as quickly as when subject to chlorine or ammonia. The death seems to be from pure poisoning. The fish will collect in masses and lie near the surface of the water for many hours, apparently having no concern of their surroundings and may be picked from the water. Even though they are transferred to pure water they most invariably die from the effect. Either of these gases are more difficult to remove from water than solids and the work of purification has been largely experimental, though at least partly successful by turning the water into large ponds then filter with coke of charcoal. A divided filter with coke in the first section and charcoal in the second is preferable. From experiments it is also probable that solutions of this kind may be purified by adding a suitable base to form a precipitate, then reclaim by a system of electrolysis.

From investigations made it would appear that all other pollutions naturally divide themselves into two classes, all composed of visible matter, which, for convenience, we will classify as organic and inorganic. The organic pollution embraces all matter subject to decomposition, which includes refuse from tanneries, soap works, phosphate works, creameries, garbage, refuse from butcher shops and common sewerage. This class of pollution is perhaps less destructive to fish life than other varieties of pollution in that it is less poisonous. Its greatest effect is that of driving fish from the streams. When such matter, particularly animal matter, reaches a certain stage of decomposition, it transforms into a slimy gelatin solution which lodges on the spawning beds, and will destroy all the spawn. Again as decomposition advances, carbon dioxide, commonly called carbonic acid, is formed, which is to some extent deleterious to fish life. Its greatest evil is due to the fact that it is a prime promoter of bacteria of all kinds, which is the source of diseases of mankind and animal life.

A number of remedies have been recently adopted to abate this class of pollution, probably among the more successful methods is to first convey the pollution into a large settling pond exposed to the air and sunlight, then attach a large coke and charcoal filter to the outlet. On decomposing the geletin matter can be removed and used as a fertilizer and the filter will absorb much of the remaining suspended matter.

The inorganic pollutions are probably the most poisonous of the several varieties as it embraces mineral poisons or mineral salts. Among this variety of industries are the several processes of paper manufacturers and dye and bleaching establishments. This nature of pollution is rather difficult to remove, owing to its degree of solvency or minute particles of suspended matter. Probably the most effective method of purification that has been tried as yet is a method of electrolysis.

Digitized by Google

During the past seven months over 200 concerns have been notified to abate the pollution of streams, the pollution coming from tanneries, oil refineries, paper mills, dye works, gas houses and saw mills. In nearly every case the pollution was entirely abated or an effort made to do so with the result that a substantial improvement was the result. During this period of time a number of devices have been installed with rather satisfactory results. Among the devices are filter beds, filter machines and electric purifiers. A laboratory will be installed in the warden's room of the Department of Fisheries in the near future for the purpose of ascertaining the nature and consistency of different pollutions, and their effect upon fish life. The per cent. required to kill fish, the qualitative conditions of the water in different streams, also experimental work on the abatement of different kinds of pollution, etc.

Respectfully submitted.

J. W. CRISWELL,
Chief Warden.

11—21—1909

Digitized by Google

OPINIONS OF THE COURTS.

The Act of May 1, 1909, somewhat changed the fish laws but no cases were adjudicated by the Court except in the case in Lehigh County, where the question of fish baskets in trout streams was raised and the court decided that where a stream is known as one inhabited by trout no fish basket could be placed in it. In York County the Court decided on very broad grounds that streams stocked with fish from the State are open to the public to fish.

In Crawford County a very important decision was rendered in what was regarded as navigable waters by the State, and the decision is one that is very far-reaching. In Butler County, where the water supply of Butler was contaminated by salt water from oil wells, the court made a broad decision that the public welfare is more important than private interests.

FISH BASKETS IN TROUT STREAMS.

Under the provisions of the act of May 1, 1909, no method of taking fish is lawful in streams known to be inhabited by trout except with one rod, hook and line. In Lehigh County a license was issued for a basket by the County Treasurer for a stream, which, without knowledge on his part was a trout stream. The owner of the license was afterwards notified by a warden to remove the basket on the ground of the provisions of the Act of May 1, 1909. The basket was not removed and he was prosecuted. The alderman before whom he was heard sustained the contention of the warden and the defendant appealed to the court. The court sustained the decision of the alderman in the following opinion:

Commonwealth of Pennsylvania, vs. Elias S. Bortz.	No.26. October T. 1909. Court of Common Pleas of Lehigh County.

Opinion of the Court on petition for allocatur in summary conviction for violation of the "fish law of 1909." The charge before the alderman was that the defendant unlawfully maintained a fish basket in the waters of a trout stream contrary to Section 8 of the Act of May 1, 1909, P. L. 353. The reason for the allowance of the appeal are that the defendant did not own the basket or erect the same, that he is not the owner of the premises on which the basket was erected, and that there was no evidence before the alderman that the basket had been operated since the passage of the act. The facts alleged in the petition are mostly those that were in controversy before the alderman. Our present inquiry is confined to the ques-

Digitized by Google

tion whether there is sufficient evidence to sustain the judgment of guilty entered by the alderman. It appears that the defendant did not take out the license but that it was taken out by one Stertz who gave it to him. It was in the name of the defendant. It was the premises of which the defendant was lessee and in a legal sense the owner for the term of his lease. After notice by the fish warden to remove the fish basket he still allowed it to remain on the premises owned as lessee, and therefore may be said to have maintained it. The defendant had an opportunity to present his case fully and fairly. There is no doubtful legal question involved. The alderman had sufficient evidence to support the conclusion at which he arrived. Under the decisions I should not interfere. Now October 14th, 1909, rule is discharged and the appeal is disallowed.

By the Court.

(Signed) FRANK M. TREXLER, *P. J.*

ALLOWANCES OF APPEALS UNDER ACT OF MAY 29, 1907, UNCONSTITUTIONAL.

In the Act of May 29, 1907, allowing the use of fish baskets it is provided that in cases of violation of the act the violator shall, if found guilty, be fined or imprisoned by the magistrate before whom the defendant is heard. The act then goes on to provide that the defendant can give bail to answer the complaint on a charge of misdemeanor. The constitution provides that in all cases of summary conviction the defendant may appeal to a Court of Record on cause shown and the act therefore seemed to amend the constitution by a mere act of the Legislature. A man in Centre County was arrested for violation of the act of May 29, 1907, P. L. 311, and was convicted. After conviction he took out an appeal under the seventh section of said act without asking for the leave of the Court. When the case came for trial before the judge on a measure to quash the appeal on the ground that this provision was unconstitutional the Court ruled that the section in question is unconstitutional in the following opinion.

Commonwealth vs. John Horner.	In the Court of Quarter Sessions of the Peace in and for the County of Centre. No. 15 December Sessions, 1907. Rule to quash appeal.

Opinion and Decree.

The defendant and appellant was arrested under the act of May 29, 1907, P. L. 311. Being convicted before the Justice of the Peace the record was brought into this court under the provisions of the 7th section of said act, by the appellant entering into his recognizance but without obtaining leave of the appellate court or of any judge thereof. The motion to quash is based upon two grounds:

Digitized by Google

First: That the 7th section violates the 14th section of the 5th article of the Constitution, and

Secondly: That the act of 1907 does not apply to the offense alleged to have been committed by the defendant and appellant.

Just why the Commonwealth alleges the second reason we can scarcely understand; for, if it is a substantial one, the Commonwealth was in the wrong to institute proceedings against the defendant under this act. As there is no evidence, however, or authorities given bearing upon this point, we for the present disregard it and give our entire attention to the first ground, namely, as to the constitutionality of the act. It is contended by counsel on behalf of the defendant, that if the 7th section of the act is unconstitutional, the whole act fatally offends against the Constitution, and that the whole proceeding should therefore fall. We cannot determine this at this time. The only question before us is whether or not the issue was properly brought into this court. There is no question that the defendant or appellant literally obeyed the provisions of the act but as the Constitution provides that leave of the appellate court or a judge thereof must be first obtained, the question is a serious one whether or not this provision is not in serious conflict with the constitutional provision. The identical question has been decided, Superior Court in Commonwealth against Luckey, 31st Superior Court Reports, page 441, where a similar provision to the act of April 22, 1905, P. L. 284, was declared to be unconstitutional and the lower court reversed. We are inclined to think that the construction of that of the Superior Court upon this part of the Constitution and its infringment by that particular act is sound, although some fairly good points might be made against it, but in any case we regard the decision of the Superior Court as authoritative upon us, and we therefore sustain the motion to quash for this reason and this reason only, namely, that the 7th section of the act of 1907 under which this proceedings was brought into court is unconstitutional.

And now, to wit, March 15, 1909, for reasons just given the rule is made absolute.

By the Court.

ELLIS L. ORVIS, *P. J.*

CONSTITUTIONALITY OF THE ACT OF MAY 29, 1901.

John McCoy was arrested in Huntingdon County for illegal fishing. He was convicted by the Justice and fined. He took an appeal to the court on the ground that the act of May 29, 1901, under which he was convicted was unconstitutional. The device he used was a dip net and in a similar case in Berks County the defendant appealed from the similar finding of the Justice on the ground that the act was a permissive one and imposed no penalty for fishing at other times than that made lawful by the act which contention the Berks County Court sustained and discharged the man. In the Huntingdon County case this point was not raised but only the

Digitized by Google

question of the constitutionality of the act. The Huntingdon County Court sustained the constitutionality of the act and affirmed the judgment of the Justice of the Peace. The following is the opinion of the Court:

Commonwealth vs. John McCoy.	In the Court of Common Pleas of Huntingdon County, Pa.

This case is before us on an appeal granted to the defendant by the Associate Judges from the decision of a Justice of the Peace on a conviction for a violation of the fish laws. The defendant alleges "that his conviction is unjust and contrary to law and the imposition of the fine and the imprisonment in default thereof would do him a great injustice." In the argument of the case, the constitutionality of the act is challenged in that it does not distinctly set out in the title the subject of the act. The defendant admitted that he did not fish with a net or device not in accordance with the seventh section of the Act of May 29, 1901, P. L. 302. The title to the act reads as follows: "An act to declare the species of which are game fish and the species of fish which are commercially valuable for food and to regulate the catching and encourage the propagation of the same; to define the public waters within the State; to protect the waters within the State from improper and wasteful fishing; to provide for the appointment of fish commissioners and fish wardens; to encourage and regulate the artificial propagation of game and food fish by said State Fish Commissioners; to regulate the distribution of the same in the waters of the Commonwealth; to provide penalties and punishments for the violation of the provisions of this act."

The title informs the reader as to what is contained in the body of the act and gives notice of the subject matter. "The title is to have a reasonable interpretation; and if it fairly gives notice of the subject of the act, so as reasonably to lead to an inquiry into the body of the bill, it is all that is necessary."

Comm. vs. Kenny, 32 Sup. 544.

and Justice Orlady in construing the title to this very act, says: "The purpose of this act is clearly defined in the very words of the title" to be "to regulate the catching and encouraging the propagation of game and food fish," and these words reasonably invite and inquiry not only into the number of times when and the methods by which such fish may be lawfully taken, but as well the methods deemed necessary by the Legislature to encourage their propagation, and the modification, if any, of former legislation on this subject," "The title substantially, though without particularity describes the subject and purpose of the act, so that everything which reasonably partains to that subject is in law suggested by the title."

Comm. vs. Kenny, 32 Sup. 544.

We are, therefore brought to the conclusion that there is nothing in or pertaining to the title which offends against the Constitution.

Digitized by Google

Decree.

And now the reasons assigned for setting aside the findings of the Justice of the Peace are overruled and the judgment is affirmed.

J. M. WOODS, *P. J.*

A QUESTION OF FREE STREAMS.

Under the Act of May 1, 1907, it was declared that it is lawful to take in the "public waters" of the Commonwealth eels, suckers and mullets by means of a gig or spear.

A York County man killed two suckers and two eels with a gig in a stream of water tributary to the Bermudian Creek. He was arrested and convicted before a magistrate on the ground that the stream from which he took the fish is not public waters under the law. From the judgment of the magistrate he appealed to the Court of Quarter Sessions of York county. The Court discharged the defendant on the ground that the Bermudian Creek, including the branch spoken of, is a tributary to the Conewago, which was made a public or free water by an act of the Legislature, and also for the reason that fish from the State had been planted in the Bermudian Creek with the consent of the owners, and the stream had been used by the public for fish purposes for fifty years becoming thus public by usage.

The ruling of the Court in regard to the Conewago being a public stream by reason of an act of the Legislature is at variance with the recent decision of the Superior Court in the case from Wayne County, that Court having declared that the Legislature could not make a stream public for fishing without compensation to the owners. The York County Court sustains the contention of the Department that the policy of the Commonwealth is to favor public fishing to as large a degree as possible and in this regard the decision of the York County Court is important as giving a judicial interpretation that where fishing has been permitted for a number of years the stream is free by usage. The following is the opinion of the Court:

Commonwealth vs. John W. Baker.	In the Court of Quarter Sessions of the Peace of York County, Pa. No. Sessions, 1909. Appeal from the Summary Conviction before N. C. May, Alderman, for illegal fishing.

Opinion.

The following facts have been agreed upon for the consideration of the Court:

"It is hereby agreed mutually, by and between the counsel for the Commonwealth and counsel for the defendant, in the above entitled cause, that the following facts shall be considered by the Court, on the trial of said cause on appeal, with the same force and

Digitized by Google

effect as if they had been proven by the testimony of witnesses under oath in open court at said trial, viz:

"The defendant, John W. Baker, on the night of June 8, 1908, killed and took two suckers and two eels by means of a gig or spear in the stream of water known as 'The Branch,' being the North Branch of the Bermudian Creek, at or near Hall Post Office, York County, Pennsylvania, and had them in his possession on the said night. The said North Branch of the Bermudian Creek has been used, at the place where the said suckers and eels were killed and taken, by the public for fishing purposes for the past fifty years.

"The owners of the stream at the place where the gigging occurred have permitted the public to fish therein without objection on their part. Fish received from the State of Pennsylvania have been planted in the Bermudian Creek upon the application of some of the owners of said stream. The said stream has never been declared navigable by Act of Assembly, and is not, in fact, navigable."

The case is before the Court on an appeal allowed by the Court from the judgment of Noah C. May, an alderman in and for the County and City of York.

It appears that the offense charged is the killing of four fish in the North Branch of the Bermudian Creek, in the County of York, on the first day of June, 1907, with a gig or spear contrary to the Act of May 1, 1907.

The complaint was made by J. W. Criswell, Chief Fish Warden of Pennsylvania, and charged the accused with the offense above stated, contrary to the provisions of the Act of Assembly approved the first day of May, 1907.

The Alderman's record of conviction of the defendant is as follows:

"And now, to wit, August 12th, 1907, at two o'clock P. M. Wherefore it appears to the said Alderman, after a careful review of the testimony in the above suit, That the said defendant, John Baker, is guilty of the charge of offense of taking and killing four fish with a gig in 'The Branch,' a stream in York county, Pennsylvania. And said stream not being public waters, as charged upon him by the said Information.

"And now, by the authority vested in me by the said Act of Assembly, I, the aforesaid and subscribing Alderman, do hereby adjudge the said John Baker guilty of taking or killing four (4) fish with a gig or spear in the 'Branch Creek,' a private water in York county, Pennsylvania; and I do hereby adjudge and sentence the said John Baker for the said offense to forfeit and pay the sum of Forty Dollars and costs of the above suit, the same being Ten Dollars for each fish so killed, to be disbursed as the Act of Assembly aforesaid doth direct. And in default of the said John Baker failing to pay the above fine and costs he be sentenced to undergo imprisonment in the County Jail of York county for a period of forty days.

"In Witness Whereof I, the said Alderman to this present Record of Conviction, have set my hand and seal, at the Fifth Ward of York City of said county, this twelfth day of August, A. D. 1907.

"NOAH C. MAY,

(Seal) *"Alderman."*

Digitized by Google

The rule is that penal statutes must be strictly construed and according to their letter.

The act providing no penalty for the killing of suckers and eels in private waters, as charged in the information, there could be no legal conviction of the defendant under the provisions of the act even if the said stream is private waters. The penalty provided in this act applies only to the killing of game fish with a gig or spear.

It was conceded at the argument that there could be no conviction under the act of 1907, and that the conviction under that act must be set aside. It was strenuously contended, however, that the defendant could be held under the act of May 21, 1901, P. L. 302, and fined by the court for fishing in private waters with an illegal appliance, and be fined $25.00.

This cannot be done for several reasons.

The defendant is brought into court on a definite charge of a violation of the act of May 1, 1907, and no other act. This trial is de novo, but the cause of action cannot be changed. Having been prosecuted for the violation of one Act of Assembly and having appealed this case to the court, he cannot, in this trial, be convicted of a violation of a law not included in the information or complaint, and of which he was not convicted by the Magistrate from whose judgment the appeal was taken. This offense being in the nature of a crime, the defendant is entitled to notice of what he is required to answer. He must be so notified by the charge as to what he must defend against, and that he may thus summon witnesses and make his defense to the prosecution.

Even if this could be done there could be no affirmance of the conviction by the Magistrate, because the creek in which the fish were killed is not, in contemplation of law, private water or a private stream in contemplation of the fishing laws of the Commonwealth.

The larger streams of the Commonwealth, such as lakes, rivers and creeks, are public waters as decided in the case of Coovert vs. O'Conner, 8 W., 470:

"All rivers, lakes and streams comprehended within the charter bounds of the province passed to William Penn in the same manner as the soil. In grants of tracts of vacant lands by him or his successors during the proprietory times, and by the Commonwealth since, streams not navigable, falling within the lines of a survey, were covered by it and belonged to the owner of the tract, who might afterwards convey the body of the stream to one person and the adjoining land to another (2 Pet., 64). When streams not navigable formed the boundary of such tract, the grantee acquired a title ad filum aquae. The larger rivers and principal streams, by nature navigable, belong to the Commonwealth, as well as where there was no tide, as where the tide ebbed and flowed, contrary to the principles of common law, and of some of the State, in which, in all rivers and streams where the tides did not ebb and flow, the grant of land, with a boundary on the stream extended ad filum aquae (Carson v. Blazer, 2 Binn., 475; Suunk v. Schuylkill Navigation Company, 14 Serg. & Rawle, 71). And the very point before us was decided by this Court in the case of Ball v. Slack, 2 Whart., 538, which case was elaborately argued and much considered. There Mr. Justice Huston, delivering the opinion of the Court, lays it down as a settled principle in Pennsylvania that when a grant or survey is bounded on a river or creek, it extends to that river or creek, and (except in the case of large navigable streams) extends to the middle of the creek."

Digitized by Google

We agree with the contention of the counsel of the defendant that the "Planting of fish in the Bermudian Creek, upon the application of the owners of the stream, entitled the public to fish in the North Branch thereof."

The Act of May 29, 1901, section 25, P. L. 310, provides, "From and after the passage of this act any waters within this Commonwealth tributary to public or free waters, in which fish received from the State are planted upon application of the owner or owners or lessees of such water, shall be and the same are hereby declared open to the public for fishing purposes thereafter."

The Bermudian empties into the Conewago and the Conewago is declared by Acts of Assembly (see Act of February 27, 1801, Laws of Pennsylvania, 1791 to 1802, page 473, and Act of March 20, 1846, P. L. 150) to be a public stream.

The Bermudian, including the North Branch thereof, being a tributary to the Conewago, a public or free water, the fish being planted in the Bermudian with the consent of the owners, entitled the defendant to fish in this stream, especially in view of the fact that the owners permitted the fishing, and the stream had been used by the public for fishing purposes for fifty years.

In support of this, reference is made to the title of the Act of Assembly of May 29, 1901, P. L. 302. This title provides that it is an act, inter alia, "To define the public waters within the State." At no place in the Act is there any definition of the public waters within the State, except in Sections 23 and 25. Here the Legislature ordains that public fishing shall exist in certain waters of the Commonwealth, and by Section 25 it is provided that certain waters shall be opened to the public for fishing purposes. There don't seem to be any doubt but that the Legislature intended that Section 23 and 25 of the Act of May 29, 1901, should be a statement of what waters in the State should be made public waters so far as the fishing rights are concerned. There is no other use of the term public waters within the State, in fish laws, except in the title to the Act of May 29, 1901, and in the Section 1 of the Act of May 1, 1907.

The Act of 1901, Sections 23 and 25, defines what are public waters within the State. The Act of May 1, 1907, provides for the regulation of fishing in those public waters. This seems to be a perfectly fair construction of both acts.

It thus appears that the term "public waters of the Commonwealth," in their primary and general meaning, means public for sovereign, commercial and business uses; but when the term "public waters" is used in Acts of Assembly, relating to rights of citizens of the Commonwealth in the waters thereof, it has a different and more restricted meaning as defined by the Act of May 29, 1901, and means all waters except those which are private streams and the lands over which they flow are owned by citizens of the Commonwealth; and in which private streams the Commonwealth cannot authorize public fishing without providing just compensation to the owners of such lands.

The several enactments by the Legislature show that the policy of the Commonwealth is to favor public fishing whenever the right can be conferred without the violation of the constitutional rights of the owner of the land.

This is not a certiorari but an appeal, and the trial is de novo, but at last the question to be determined is: Shall the judgment of the magistrate be affirmed or reversed. The facts have been agreed upon.

Digitized by Google

In all reported cases of judgments of Courts of Quarter Sessions, in appeals from cases of summary conviction, the judgments are either that the judgment of the magistrate is affirmed or reversed. This is a strong additional reason why the defendant in this case cannot be convicted of another offense than that contained in the complaint and under an Act of Assembly with the violation of which the defendant is not accused.

Upon due consideration, we are of the opinion that the defendant was illegally convicted of the offense of which he is charged; and that the judgment of the magistrate must, for reasons stated, be reversed.

The costs in this case were paid by the County of York when the bill of indictment against the defendant was inadvertently sent before the Grand Jury and ignored and the County of York ordered to pay the costs. This leaves only the costs since accruing, which is a small amount to be provided for.

And now, February 15, 1909, the judgment of the magistrate is set aside and the County of York is directed to pay the costs which remain to be paid.

By the Court,

JOHN W. BITTENGER, P. J.

PUBLIC WELFARE GREATER THAN PRIVATE INTERESTS.

In 1877, the Butler Water Company was organized to furnish the town of Butler with water. The company erected a reservoir in the Connoquenessing Creek for the purpose of storing water and supplying their customers with water therefrom. In the watershed of the creek were some oil wells which were pumped from the sand called the "one hundred foot" sand, and the very small quantity of oil was produced with a large quantity of salt water. The salt water from these wells being allowed to flow into the stream so polluted the water for the water company that it erected another reservoir further up the stream.

Recently several persons have bored wells and have been pumping them for oil, the quantity of oil running from one barrel to about ten barrels a day to a well with a result of thirty or forty times that much salt water. This salt water, it is claimed, so polluted the water in the reservoir as to render it unfit for use. The water company asked for an injunction to restrain the owners of the wells from pumping the salt water and were joined in a petition by the Attorney General of the Commonwealth on the ground that the water flowing from the wells so polluted the water supply of Butler as to render it a nuisance to the public health.

The case was heard in the Court of Common Pleas of Butler County in equity before Hon. George S. Crisswell, President Judge of Venango County, who, in a very able decision, granted an injunction as prayed for. The ground taken by the Court was that the general welfare of the public overweighs any individual interests.

Digitized by Google

The amount of oil produced by the wells in question, as shown by the testimony, is very small, and in all the cases except one the wells were bored after the watershed had been taken for the purpose of supplying the town of Butler with water, the town having a population of over 18,000. It would appear from the facts that the watershed in question is the only place that a water supply can be obtained sufficient for the needs of the growing population and its various manufacturing interests.

The question is a very important one as showing that the Courts are taking a decided view in regard to policies where the public interests exceed those of the individual. If the decision of the Butler County Court is sustained by the higher courts it will mean a great advance in the matter of putting a stop to the pollution of the streams, which pollution now destroys much fish and aquatic life and also threatens human life.

It will be observed in discussing the case the Court speaks of the case where the Supreme Court decided that as coal is a necessity private interests must suffer until some method is found to make water run uphill, but it also quotes in speaking of the opinion a remark that a time may come when public interests will demand the stoppage even of this pollution by coal mines.

The following is the opinion in full:

The Commonwealth of Pennsylvania ex rel., M. Hampton Todd, Attorney General, and the Butler Water Company,

vs.

T. H. Hanratty, H. G. Litzinger, L. P. Litzinger, Litzinger & Company, J. L. Young, George Amy, John Hines and H. Bowers.

IN THE COURT OF COMMON PLEAS OF BUTLER COUNTY, PENNSYLVANIA.

IN EQUITY.

No. 5. December Term, 1908.

This cause came on to be heard upon Bill, Answer and Evidence and therefrom the following are derived as the material.

FACTS.

1. The Butler Water Company is a corporation organized under the Act of Assembly of the Commonwealth of Pennsylvania approved the 29th day of April, 1874, entitled "An Act to provide for the incorporation and regulation of certain corporations," and the supplements thereto, for the purpose of supplying the Borough of Butler in said county with water. Letters patent were duly issued to it as such and its charter was recorded on the third day of November, 1877, in the office of the Recorder of Deeds of said county in Charter Book No. 1, page 134.

2. The said Borough of Butler is located near to and on the banks of Connoquenessing Creek, in said county, and has a population of about 18,000 inhabitants, with several railroads, numerous shops, plants and manufactories requiring water for domestic, steam, fire and other purposes.

Digitized by Google

3. Pursuant to its charter and the object of its incorporation the said water company installed a plant, consisting of dam or reservoir, near the borough limits, pumps, mains, conduits and pipes, for the purpose of taking water from the said creek and supplying and distributing the same to the inhabitants of the said borough for the various uses for which it might there be required.

4. About 1895, because of oil developments on the lower watershed or the run above the company's dam and direct source of supply and the quantity of salt water coming from oil wells drilled and operated in the vicinity, the waters of the creek at that point became unfit for use for general and domestic and other purposes, and a larger reservoir or impounding dam was constructed on the said creek at Boydstown, about seven miles up said creek from the borough, with a capacity of about 94,000,000 gallons.

5. About 1903, because of the increased demand for water, another reservoir, with a capacity of about 216,000,000 gallons, was built by the company about three miles from the borough, on Thorn Run, a tributary of said Connoquenessing Creek, which empties into the same at a point some distance below the Boydstown reservoir.

6. The waters of said Connoquenessing Creek and watershed, taken from the points above indicated, have been the sole supply of the said water company since its organization and is the only practically available source from which an adequate supply of water, of reasonably good and pure quality can be obtained for the uses of the company and the public for which it is its duty to serve.

7. About the year 1903 the company installed a filtering plant near its pump station through which practically all the water since furnished by the company to its patrons has passed.

8. Prior to the organization of the said company and its appropriation of the waters of the said creek in 1878 there had been drilled quite a large number of oil wells within the limits of the watershed of the creek, chiefly, however, near the source of the stream and its upper tributaries, and from such wells some salt water was produced, but the oil obtained therein was not generally found in or produced from sands containing salt water in large quantities so as to effect the purity of the waters of the stream below or render it impure, unfit or unsuitable for domestic consumption, steam or other purposes for which it was required by the public of the community which the company, by the terms of its charter, was to supply with water.

9. In that locality the sand in which is found any considerable volume of salt water is known as the hundred foot sand. The first distinctive field in which oil was produced from this sand was some distance south of Butler and the watershed in question and this was in the early nineties. About 1894 and 1895 there was some production from this sand within the lower limits of the watershed, and the salt water from the wells rendering the waters of the stream there unfit for use. This resulted in litigation at the time and also in the erection of the upper reservoir at Boydstown, referred to.

10. At the time of the erection of the said Boydstown reservoir the waters of the creek were practically pure and suitable for domestic and general public use. About that time, the exact date not particularly appearing, a well was drilled on the Ritzart farm located on Duffy Run, a tributary entering Connoquenessing Creek at the reservoir, from which some salt water was produced. Afterwards another

Digitized by Google

well was drilled on the said farm likewise producing salt water. The water from these wells was for a time carried below the reservoir by means of pipes, and the operation of the wells was then discontinued.

11. Subsequently these wells came into the possession of the defendants, Hanraity and H. C. and L. P. Litzinger. They began operating the same either as individuals or as Litzinger and Company and for a short time forced the salt water over a dividing ridge so that it reached a tributary entering the main stream below Boydstown reservoir. Because of objections made to this disposition of the water, however, it was soon thereafter turned and allowed to flow into the space between the larger and smaller lines of casing in the wells. How deep the water passed in this space does not appear, but afterwards salt water was discovered coming from the ground along the run below the wells. This fact, together with the tests made for salt or chlorine in the water indicate that the salt water from the wells passed through the earth to the run and from there to the reservoir.

12. These wells on the Ritzart farm, after coming into the possession of the defendants named, were pumped about a year before oil was obtained, producing at first about eighty barrels of salt water per hour, and they are still producing about thirty barrels per hour, besides about four barrels of oil per day with considerable more than sufficient gas to operate the wells. The quantity of oil being produced has been gradually increasing and the market price of the same is $1.63 per barrel.

13. What is referred to as the "Young Well," belonging to and operated by the defendant, J. L. Young, is located about five-eights of a mile above the Litzinger wells on Duffy Run. It was drilled after the location of the Boydstown reservoir and has been producing 55 barrels and upwards of salt water per day and from one-half to two-thirds of a barrel of oil from the hundred foot sand besides gas for gas engines, two houses, with a considerable surplus. The water from this well flows down into Duffy Run, reaching the reservoir, except during drought periods, when the water sinks into the ground, leaving no surface flow for a considerable distance below the well.

14. What are known as the Amy and Hines wells, two in number, are located on Larimer Run, a tributary of the Connoquenessing Creek north of Duffy Run and entering the Boydstown reservoir near the upper end thereof. They are distant about three-fourths of a mile from the reservoir. One was drilled before and one after the construction of the reservoir and are now owned and operated by the defendants, George W. Amy and John Hines. They produce from ten to twenty barrels of salt water and not exceeding two barrels of oil per day. The salt water passes from the wells to the run by surface flow. At times during the period of dry seasons it sinks in the ground on its passage from the wells before reaching the flowing waters of the run.

15. The Bowers wells, owned by the defendant, H. Bowers, are located west of the creek and near the northerly end of the reservoir. One of them was first drilled in 1873 or 1874. Afterwards, about twenty years ago, and shortly before the location and construction of the reservoir, being drilled deeper to the hundred foot sand. Whether or not it was thereafter continuously operated, or how much it was operated does not appear. The other well was drilled

Digitized by Google

about ten years ago, after the building of the dam. These wells are and for some time have been operated and are still producing from twelve to fifteen barrels of salt water per day and about two barrels of oil. The salt water is deposited on the ground and reaches the reservoir by Fleeger Run.

16. What is known as the "Hutchinson well," belonging to Hanratty and the Litzingers, is located on the headwaters of Thorn Run above the reservoir of the plaintiff company on that run, and was drilled about a year ago, but not pumped until January last. It was drilled to the fifth sand, but pumped from the hundred feet, producing salt water in large quantities at first and afterwards declining to in the neighborhood of two hundred barrels per day. It produced as high as twelve barrels of oil in one day at first, but the later production is not stated. The salt water was permitted to flow on the ground and into pits dug to receive it. After this was done fresh water springs on the adjoining tract became salt and the water therefrom passed into the channel of Thorn Run and from thence to the reservoir.

17. At various points throughout the watershed of Connoquenessing Creek, including the basins of Duffy, Larimore and Thorn Runs, there are coal mines or drifts, either now open or abandoned, from which there flows or slowly passes small streams of what is commonly known as brackish or surplus water having on it in places a scum or oily appearance, from which, from a short distance after it first reaches the surfaces there is deposited a colored sediment. There are also in the basin a number of wells drilled for oil which are flowing water slightly tinctured with sulphur, some of it having a flat, brackish taste, but neither the water from these nor that from the coal mines are sufficient in quantity or quality when mingled with the natural surface waters of the valley to affect the practical purity of the main streams of the watershed.

18. At and for some time prior to the time of the filing of the plaintiff's bill of complaint herein the waters of the Boydstown and Thorn Run reservoirs, those of the former to a greater degree than those of the latter, had become impure and at times wholly unfit for use in the generation of steam, unsuitable for washing and other domestic purposes and detrimental to pipes, machinery and fixtures in which it was used, by reason of the excessive quantities of chlorine deposits therein and such chlorine deposits came chiefly from the salt water pumped into the stream and deposited on the lands adjacent thereto above the said reservoirs and within the basins drained thereby, by the defendants as hereinbefore indicated and found.

19. There is no record or other evidence of any direct corporate action taken by the company, in the exercise of its rights of eminent domain, condemning the waters of the stream, either at the first or lower dam at the pump station, or at the upper reservoirs at Boydstown and at Thorn Run.

20. In the year 1880, George Reiber presented the said court, as appears by the records thereof at A. D. No. 24 of December Term, 1880, his petition setting forth the water company had entered upon and appropriated to its use certain of his lands situated on both sides of the Connoquenessing Creek for use as a dam, together with the waters of the creek, for the purpose of supplying the Borough of Butler with water, and asking that his damages for such entry upon

Digitized by Google

and appropriation of land and stream be assessed by viewers to be appointed for the purpose. Such viewers were appointed and damages were accordingly awarded him. The land so referred to and taken is the same upon which the first or lower dam was constructed.

21. On November 5th, 1895, the water company presented to said Court its petition setting forth that it had surveyed and ascertained the boundaries of a piece of land belonging to the widow and children of Hector Craig, on which it had located in part a reservoir and dam for its corporate purposes; that it had been unable to agree with the owners relative to the damages done or likely to be done or sustained by them in consequence of such taking and praying the Court to appoint viewers to estimate and determine the quantity, quality and value of the said land, streams and property so taken. This was done and the viewers awarded the owners $310.00 as their damage for the "lands, streams and property" so taken. The lands in these proceedings described and referred to are part of the lands upon which the Boydstown reservoir is located.

22. On November 7th of the same year a like petition was presented by the company for the appointment of viewers to assess the damages done to the estate of William B. Clymer, deceased, for other lands, streams and property taken as a site for the said reservoir at Boydstown. This was done and the damages were appraised at $701.50.

23. On July 18th, 1903, viewers were appointed upon the petition of Sarah A. Sopher, et al. to estimate and determine their damages by reason of the taking by the water company after bond was given and approved by the Court of a certain tract of land surveyed and appropriated by it as a site for the Thorn Run reservoir containing 36½ acres in Oakland Township, part of the Henry farm, and also the taking of a right of way leading from said land southwesterly 1,110 feet. No damages are prayed for on account of the taking of the stream, but the viewers' award includes damages on that account, the total being $3,000.

24. On January the 8th, 1906, upon the petition of the Independent Natural Gas Company, viewers were appointed by the said Court to determine the damages suffered by it as lessee of a certain portion of the said Henry farm mentioned above, the damages awarded being $4,892.45.

25. The said water company also purchased in fee various other tracts of land along the runs upon which the reservoirs are located, but the descriptions of the same, as contained in the deeds offered in evidence, are not such as to indicate definitely and fully their location with reference to each other or the reservoirs.

26. Since the organization of the water company and the inception of its operations under its charter in supplying the public of the said Borough of Butler with water in or about the year 1878 it has appropriated and used the waters of the said Connoquenessing Creek for its corporate purposes and it now has about 2,900 taps upon its distributing pipes and mains in the Borough, furnishing water to approximately two-thirds of the inhabitants of the Borough, besides large manufactories and transportation companies and the municipality itself for fire protection.

Digitized by Google

27. A number of the inhabitants of the Borough are supplied with water from springs and wells drilled and pumped by them or other persons than the water company for the purpose. The water thus supplied is, in some cases, suitable and satisfactory. In many it is not, being objectionable for washing and other domestic purposes because of magnesia and other mineral deposits found therein. Besides it is not known that there is any sufficient supply of the water as the production of the wells generally decline with use, in some instances quite rapidly.

28. The wells referred to from which salt water is being produced, with the exception of the Bowers wells, which are at the north end of the Boydstown reservoir, are located on the southeasterly border of the basin drained by the creek into the Boydstown dam and the northerly border of that drained into the Thorn Run reservoir, the Hutchinson well alone being within the limits of the latter, and all are embraced within a comparatively small portion of the entire basin of Connoquenessing Creek drained into the said reservoirs.

29. The evidence discloses the fact that some of the defendants and others have refrained from drilling other wells within the known limits of the said hundred foot territory above the said reservoirs because of their anticipated effect upon the waters of the said streams and reservoirs. If additional wells are drilled through such known territory, producing like quantities of salt water as those already drilled, the water company will be required to abandon the field as the source of its water supply, or the operators will be required to conduct such salt waters to a point or points below or elsewhere, where the same will not mingle with the waters supplied to consumers by the company.

30. Because of the small yield of oil from the wells operated by the defendants and the injurious and destructive effect of salt water upon metallic pipes ordinarily used for the purpose, it is doubtful whether any of the defendants can profitably operate their wells and conduct the salt water coming therefrom to a point or points below the reservoir to the outside of the basin or the streams leading thereto.

31. The oil cannot be produced from the said hundred foot sand without at the same time bringing to the surface the salt water found therein nor is it practicable to remove the chlorine or salt from the water at an expense which would justify operating the wells, and doing so.

32. The damages which would result from an order restraining the defendants from permitting the salt water taken from their wells to flow into the streams draining into the water company's source of supply would be small in comparison with the loss which would result to the water company by reason of the contamination of such source of supply and the rendering of the waters thereof unfit for general public use.

33. In so far as the determining facts are disclosed by the evidence the production of the wells being small and the expenses of operations necessary to keep the water flow down being heavy, the injury and damage which would result to the owners of land within the limits of the known field of productive hundred foot sand within the basins drained into the said reservoirs, from an order restraining such

Digitized by Google

owners from permitting salt water taken from wells therein to flow into the said reservoirs and the streams leading thereto would be small in comparison with the loss which would result to the water company and the community supplied by it, from the destruction of the present source of water supply of the company.

PLAINTIFF REQUESTS FOR FINDINGS OF FACTS AND ANSWERS THERETO.

1. The Butler Water Company was chartered by the Commonwealth of Pennsylvania under the act of April 29, 1874, on the third day of November, 1877, to supply water to the inhabitants of Butler, Pa., which is a borough and has a population of about 20,000 people.

Ans. Affirmed, except that the population of the borough may not exceed 18,000 inhabitants.

2. It acquired property by purchase of a power house and a distributing reservoir and condemned property for a dam or reservoir on the Connoquenessing Creek on the lands of George Reiber near the eastern limits of the borough of Butler, together with the waters of said stream, by proceeding in the Court of Common Pleas of Butler County, in the year 1880, since which time it has been continually appropriating and using the waters of said stream as its only source of supply and from that source supplying about two-thirds of the population of Butler for domestic use, the entire supply for fire purposes, supplying the four steam railways and nearly all its manufactories.

Ans. Affirmed except that the facts as to the appropriation and condemnation of the stream are as indicated in the general findings of the Court.

3. In 1895 because of extensive drilling of deep wells for oil on the watershed above its dam or intake, it erected a large impounding reservoir with a capacity of 94,000,000 gallons on said stream, the Connoquenessing Creek, near Boydstown, distant about seven miles from Butler borough and further up stream. By condemnation proceedings in the said court in 1895 it condemned the lands occupied by said reservoir and in which the condemnation also included the stream of water therein. Said condemnation embracing part of the lands of the Craig heirs and part of the land of the W. B. Clymer estate. In 1903 it again condemned the lands on Thorn Run, a tributary of said Connoquenessing and which empties into it about one and a half miles north of Butler, which condemnation proceedings also included the streams thereon. It also acquired some lands for said purpose by purchase in fee and erected another large impounding reservoir thereon in 1903 with a capacity of about 260,000,000 gallons. This reservoir is located about three miles from Butler.

Ans. Affirmed with qualifications indicated in answer to the preceeding request.

4. From these reservoirs the plaintiff company has at all times had a sufficient supply of reasonably pure water except as herein below stated and this is practically the only available source of supply for said company.

Ans. Affirmed.

Digitized by Google

5. In this territory there is a loose sand rock or stratum at a depth of about 1,200 feet from the surface, which is a well-defined stratum of rock and is also known to be the depository of large quantities of salt water similar to the water of the ocean. In many places oil is also found in varying quantities in this rock. This salt water does not rise and flow out naturally from wells drilled into said rock, but is pumped or raised to the surface by machinery. The oil and water are usually brought up together and discharged into a tank where they immediately separate, the oil being the lighter liquid rises to the surface and is carried away by pipes near the top of the tank and the water taken in the same way from the bottom of the tank. This hundred foot sand was not known as a distinctive oil bearing rock or operated as such until about eighteen or twenty years ago, although some oil was obtained from occasional wells before that time.

Ans. Affirmed.

6. In 1895, by reason of extensive development on the watershed of said creek, large quantities of salt water found its way by gravity from tanks into said stream and polluted the plaintiff company's water supply, rendering it unfit for use of any kind except for flushing sewers and for car purposes. Litigation resulted from this condition and is fully reported in the case known as Commonwealth v. Russel, 172 Pa., page 506.

Ans. Affirmed.

7. In 1905 wells were drilled on a tributary of said creek called Duffy Run, which empties into the Boydstown reservoir. An injunction was obtained against the then owners of the wells restraining them from polluting the plaintiff's reservoir with salt water. The owners thereupon made arrangements by which they carried or pumped the salt water from their wells to a point below said reservoir and so continued to operate their wells for about one year, after which the present defendants, Hanratty and Litzinger became the owners thereof. These wells are known as the wells on the Ritzart farm. The amount of salt water produced from them is diminishing, but they are still producing about six hundred barrels per day. The salt water from these wells for about one year has been finding its way by gravity into the Boydstown reservoir and is polluting the same.

Ans. Affirmed.

8. A well was drilled on the John L. Young farm about one-half mile further up Duffy Run and on the headwaters thereof, about.... years ago which produced about fifty barrels of salt water per day and flows by gravity from the tanks into Duffy Run and from this finds its way into Boydstown reservoir and has been so flowing for one year or more and is polluting the same.

Ans. Affirmed.

9. Two wells known as the Amy and Hines, are located on a branch of said creek called Larimer's Run, which also empties into the Boydstown reservoir about a mile below said well. These wells produce about ten or fifteen barrels of salt water per day, which flows from the tanks by gravity, finds its way into Larimer's Run and thence into said reservoir and is polluting the same.

Ans. Affirmed.

10. There are a number of other wells on the watershed of said creek, most of which are known as third and fourth sand wells. The strata from which they produce oil lies deeper than the hundred foot

Digitized by Google

sand and free from salt water. From a number of these wells small quantities of salt water are produced and have been produced for many years, but in quantities so small that they have not hitherto affected and do not now seriously affect the said water supply.

Ans. Affirmed.

11. By reason of the large quantities of salt water produced from the Hanratty and Litzinger wells on the Ritzart farm, the Young well on the Young farm, and the Amy and Hines wells on Larimer Run, the water of plaintiff's reservoir at Boydstown became so impregnated with salt water during the fall and winter of 1908, which was a season of extreme drought, that the water became unfit for domestic use and unfit for use in boilers, and many of the patrons of the plaintiff company quit using its water and sought supplies elsewhere.

Ans. Affirmed with the addition that the waters from the Bowers and other wells contributed to the impurities then found in the water.

12. The defendants, Hanratty and Litzinger, drilled a well into the hundred foot sand on the Hutchinson farm on the watershed of Thorne's Run reservoir and started in to pumping about January 1, 1909, and have continued to operate it since that date. The well produces about three hundred barrels of salt water per day, which flows from the tanks by gravity over the surface and a large quantity of which has found and is finding its way through Thorne's Run into the plaintiff's Thorne Run reservoir and is polluting that source of supply. From the location and distance of this well from this reservoir, the quantity of salt water produced and the constant increase of chlorine or salt in the waters of this reservoir will soon be so seriously polluted as to render it wholly unfit for domestic use and for other purposes.

Ans. Affirmed except as to present flow of salt water, covered by general findings.

13. The water from the Hanratty and Litzinger wells on the Ritzart farm was carried, by a former owner, by gravity through pipe lines past the Boydstown reservoir and can be so carried again and at cost that does not prohibit. The Young well, the Amy and Hines wells, and the Hanratty and Litzinger wells on the Ritzart farm and their well on the Hitchinson farm are each and all so located that the salt water can be run from each by gravity to a point past said reservoirs and at a cost of about $1,500 per mile, which is not unreasonable or prohibitive.

Ans. The evidence does not justify the affirmance of this request, and upon this point reference is made to the general findings.

14. It has not been shown satisfactorily that either an adequate supply and, at the same time, a reasonably pure supply of water can be obtained by the plaintiff company for the purpose of its charter from the drilling or sinking of water wells, nor has it been shown that there is any other adequate source of supply available to the water company save at a cost that would be absolutely prohobitive.

Ans. Affirmed.

Digitized by Google

DEFENDANTS' REQUESTS FOR FINDINGS OF FACT AND ANSWERS THERETO.

1. That the oil and salt water are so mixed and mingled under the ground that they must be pumped out together and separated after reaching the surface; that there is no machinery or way known to the business of producing oil that will separate the same before reaching the surface; that after being pumped into tanks on top of the ground, the salt water sinks, leaving the oil on top, the salt water is poured out upon the ground and by gravity is forced into the streams which lead to the Connoquenessing Creek; that there is no way known to the business by which this salt water can be consumed, destroyed, evaporated or impounded, so as to prevent its obeying the laws of gravitation and seeking the stream of the Connoquenessing Creek by way of the tributaries leading, from the land on which it is produced, to said creek.

Ans. Affirmed with the qualification that there is no available practical way of disposing of the salt water aside from that indicated.

2. That during the summer and fall of 1908, the time when the complaint in the bill is laid, the streams leading from the Amy and Hines wells, from the Young well and from one of the Bowers wells, were totally dry, and that there could not be, and was not any salt water flowing from any of said wells, or through any of said streams into the plaintiff's reservoir.

Ans. Refused. Upon this point reference is made in the general findings.

3. That in the case of the Litzinger wells on the Ritzart farm the salt water, after being separated from the oil, is returned into the bowels of the earth, on the outside of the casing, to a possible depth of six hundred feet; the said process has been employed for a period of two years; and that the salt water from these wells is not, therefore, discharged into the streams nor into the plaintiff's reservoir.

Ans. Refused. Upon the subject reference is made in the general findings.

4. That in the case of the Litzinger well on the Hutchinson farm the same is located about fifteen hundred or two thousand feet from any stream; that after the salt water is separated from the oil at this well it is discharged upon the ground, where it flows over the surface for a possible distance of from five or seven hundred feet, and then soaks into or is absorbed by the ground; and that the salt water from this well does not and never has flowed into the stream or into the plaintiff's reservoir.

Ans. Affirmed except as to concluding statement. The facts relating to such statement are covered by the general findings.

5. The said creek and its tributaries are the natural channels into which the salt water produced by defendants in their oil operations flows and by which it is carried away.

Ans. Affirmed.

6. That the plaintiff company can at a reasonable cost and expense supply the inhabitants of said borough with a full and adequate supply of pure and wholesome water from sources outside and independent of said Connoquenessing Creek.

Ans. Refused.

Digitized by Google

7. The plaintiff company, by laying a line to the Connoquenessing Creek above the point where the salt water reaches it, can there procure as large a supply of water in the summer months as at the point where its plant is located and as of good quality as the said creek will afford; and the water supply for said town being a constant and known quantity it would be more profitable and less expensive for said company to do so than for defendants to collect and care for the salt water which is an unknown quantity, uncertain in amount and changeable.

Ans. Refused.

8. That the defendants are engaged in a legitimate business, which they are conducting in a legal manner without malice or negligence and at the only place where said business can be carried on, and it is not through any neglect on the part of the defendants or their employees that the salt water finds its way from their wells into said creek. That the expense of preventing the damage, if any, resulting from the operating of the wells of defendants is such as to practically counterbalance the expected benefit and to be prohibitory by reason of such expense of the further operations of said wells.

Ans. This request involves conclusions of law as well as fact. As a whole, it is refused. The concluding statement is affirmed as being probably true.

9. That prior to the time the plaintiff company began using said creek as a water supply, to wit: In the year 1878 the watershed of said stream was then being operated for oil and had been so operated for a number of years, to wit: Six years prior thereto, and that there were upwards of three hundred wells producing oil and salt water in large quantities, both from the "hundred feet" and lower oil producing sands many of said wells producing more than one thousand barrels of salt water per day, all of which flowed into said streams whereby the waters of said stream were for a long time contaminated by the drainage from the wells then drilled on said watershed; and that at the time the said water company began using the waters from the Connoquenessing Creek; that watershed whereof was a large developed oil producing territory; and that the pumping of salt water in said Connoquenessing Creek began in the year 1872.

Ans. As early as 1872 oil developments began on the upper watershed of said creek, but the oil was obtained generally in other than the hundred foot sand and the water of that sand was usually shut off by casing or a packer. There were occasional wells pumped from the hundred foot and lower sands at the same time and the flow of salt water from these was in exceptional cases large, but at the time of the location of the reservoir at Boydstown the number of such wells was so limited and salt water from all wells in the upper valley was so limited in quantity as to not effect the practical purity of the water at the site selected for the reservoir. As thus modified the request is affirmed.

10. That the business of producing oil in Butler county has been a great benefit to the citizens thereof and millions of dollars' worth of oil have been produced within her borders and the said business cannot be carried on without in a greater or less degree impregnating with salt the waters of the stream in the watershed so operated.

Ans. The first part of this request may be affirmed on common knowledge, but it is without supporting proofs in the record. The

Digitized by Google

latter part of the request is affirmed as being generally true to some extent.

11. At and prior to the time the Butler Water Company established its plant and began supplying the water to the inhabitants of said borough it was a fact of public notoriety well known in the community that the business of operating for oil was one of the principal industries of Butler county, and that the watershed of said creek had been and was still being operated for oil and was a developed oil producing territory and was an extensive oil producing territory for six or seven years prior thereto.

Ans. This request lacks supporting proofs except that the upper portion of the watershed was developed and producing oil territory and has been for about six years. To this extent only the point is affirmed.

12. That the salt water produced by the defendants and others which has flowed into the Connoquenessing Creek is not unwholesome in itself and has not produced and injurious effects on the general health of the Borough of Butler; and that there is no appearance or detection of salt at any time in the water as furnished to and used by the citizens of Butler to a perceptible or injurious extent.

Ans. This request covers facts not proven. Dr. Hockenberry says that salt in water makes it unpalatable and if the percentage were too great it would be injurious to health, but what such percentage is he states he does not know. Whether or not the water coming from defendants' well is or is not injurious to health is not shown. The request as a whole is refused.

13. That the said defendants and others operating for oil in the same vicinity of the watershed of the Connoquenessing Creek, in what is known as "hundred foot" district thereof, are the owners of large bodies of leases for oil purposes aggregating several thousand acres, and have already invested large sums of money for the purpose of developing the same for oil from the "hundred foot" and other oil producing sands, estimated at over a million dollars.

Ans. Refused. No evidence is recalled which will sustain it.

14. The defendants and said other persons are developing said territory and operating thereon in the usual and ordinary manner of developing and operating "hundred foot" territory.

Ans. The manner of operating and developing hundred foot territory outside of the particular field in question is not shown. The defendants and those operating in this field appear to follow the same methods.

15. There is no known method by which the oil can be produced and pumped from the "hundred foot" sand or oil bearing rock without at the same time and with the oil, producing and pumping to the surface the salt water contained in said sand or oil bearing rock.

Ans. Affirmed.

16. That it is impracticable for the defendants and others operating and developing said "hundred foot" territory to care for the salt water necessarily produced at any reasonable cost or expense; and to require them to do so would be in effect to prohibit the production of oil in that field.

Ans. Where the wells are small, having no greater production than those owned by the defendants and located as are those of Hanratty and the Litzingers and Amy and Hines and Young this would appear to be true. The Bowers wells could probably be profitably operated.

Digitized by Google

17. That neither of the defendants in this bill nor others operating in the same territory are vested with the right of eminent domain and have no right to enter upon or cross the lands of other persons for the purpose of piping away the salt water produced by them to a point below plaintiff company's plant, which fact, in the absence of the consent of the intervening land owners, renders their doing so a legal impossibility.

Ans. Affirmed.

18. Even if the defendants had the right of eminent domain, yet the uncertain and ever-increasing amount of salt water to be taken care of would render it impracticable so to do inasmuch as any pipe line constructed for that purpose would have to be of sufficient capacity to accommodate the prospective increase of salt water from the unknown number of wells that may yet be drilled, and the salt water would require to be collected by lateral lines over a large extent of territory, to wit: over thirteen thousand acres to each producing well and carried in this way to the common conduit, and this in turn would require the joint harmonious and voluntary action of all the producers, both present and prospective, in that territory and would have to be carried to the Beaver River.

Ans. This assumes that water lines would have to be extended over this entire watershed of the creek which is not warranted. Otherwise the request is affirmed.

19. Even if the salt water were being taken care of and could be taken care of in some practical way, yet the unavoidable leakage from the pipe line conducting the same away from the lease and from connection and tanks about the wells from tearing down the tanks from the bailings and sand-pumps of the wells and other necessary washings from and about the wells, would of itself be sufficient to contaminate the waters of the creek.

Ans. refused.

20. The defendants in carrying on their business of operating for, producing and developing oil, are doing so in such a manner as to do the least harm consistent with the natural use of their own property, and Litzinger, Hanratty & Company have already expended upwards to one thousand dollars for equipments, appliances and things necessary in their efforts to prevent and avoid any injury or damage to the plaintiff company by reason of said operations.

Ans. Assuming that pumping the salt water upon or into the ground is a natural use of their property, this point is affirmed, except as to the amount expended by Hanratty, Litzinger & Company, which is not definitely known. But it is not understood that such pumping of salt water is a natural use of the land.

21. That the defendants or those claiming under them since the answer in this case was filed, cannot avoid the injury if there be any, inflicted upon the Butler Water Company and inhabitants of Butler Borough, who are consumers of the waters furnished by the said company without abandoning the use of their property or an outlay of expense, which would practically more than counterbalance the expected profit or benefit to be derived from the development for oil purposes of the land on which the wells are situate.

Ans. Affirmed as hereinbefore indicated.

Digitized by Google

22. The defendants are operating their wells in producing oil from the "hundred foot" sand in the ordinary and usual manner, that being only the natural use and enjoyment of their property without negligence or malice. As the operations of the wells continue the value of oil increases and the volume of salt water decreases, this being emptied upon the ground flowed by the natural course of gravity into tributaries of the Connoquenessing Creek.

Ans. The request embraces several propositions. The first, that the defendants are operating their wells in the usual manner of operating oil wells is affirmed. That they are so operating them without actual malice, or what is termed illwill, towards the water company is also affirmed. Whether or not they are operating them without negligence or without malice in its broader sense are rather legal questions arising upon the facts found and reference is made to the discussion and legal conclusions. The latter part of the request is affirmed as being literally true of the wells in the locality.

23. That to enjoin the defendants from pouring out the salt water so raised with the oil from underneath the ground to its surface would be to enjoin them from drilling for and producing their gas and oil, and effectually deprive them of the use and enjoyment of their private property and be taking and applying it to public or private use without authority of law and without just compensation being first made or secured.

Ans. This, as a request for the finding of a fact is refused. It is a request for a legal conclusion and is refused as such.

24. That the only known method by which the salt water can be conducted around the plaintiff's dam is by pipe lines; that the cost of constructing such lines would exceed forty-seven hundred dollars per mile, and that such pipe lines would have to be reconstructed at intervals of not more than a year or fifteen months by reason of the action of the salt water in eating out and destroying the pipes.

Ans. This request, as a whole, is refused. The cost per mile under the evidence would not be nearly as much as stated and the pipes generally would last longer than stated, the length of service depending to some extent of course upon the character and quality of the pipes used.

25. That the price of oil is $1.63.

Ans. Affirmed.

26. That the daily output of the Bowers' wells is about two barrels of oil and sufficient gas to operate his wells; and that his loss if he is compelled to take care of his salt water would be a total loss to his property estimated at $8,000.00.

Ans. Refused. There would not be a total loss of his property and the damage to him would not be nearly $8,000.00.

27. That the daily output of the Amy and Hines wells is about two barrels of oil and sufficient gas to operate the wells; and that their loss, if they are compelled to take care of the salt water, would be a total loss to their property estimated at $2,000.00 or $2,500.00.

Ans. Refused The loss would not be a total and would be less than $2,000.00.

28. That the daily output of the Young farm well is about two-thirds of a barrel of oil and enough gas to operate the well, furnish two houses with light and heat and light his premises about the well

Digitized by Google

and house; and that his loss, if he is compelled to take care of the salt water, would be a total loss of his oil property estimated at $2,000.00 or $2,500.00.

Ans. Refused. The loss would be less than $2,000.00.

29. That the daily output of the Litzinger & Hanratty wells on the Ritzart farm is over four barrels of oil and sufficient gas to run the wells, steam the oil, light the premises about the wells, light and heat the pumper's office, and a surplus of gas over and above these uses of 29,200 feet per day valued at nine cents per thousand feet at the wells. That the daily output of the Litzinger & Hanratty well on the Hutchinson Farm has run as high as twelve barrels of oil with sufficient gas to operate the well, steam the oil, light the premises about the well, and a surplus of gas over and above these uses of 10,000 feet per day valued at nine cents per thousand feet at the well. That the total loss to Litzinger & Hanratty if they are compelled to take care of the salt water would be a total loss of their property estimated at from twelve to fifteen thousand dollars.

Ans. This request is regarded as placing the quantities of gas which might be marketed as too high, also the quantity of oil produced from the Hutchinson well is too high and the loss on both wells as too high. The oil produced from the Hutchinson well is not shown and the evidence does not wararnt a finding that it is twelve barrels per day. The loss of these owners on their three wells, if restrained from pumping the salt water upon the ground or disposing of it as they are now, would be several thousand dollars, but cannot be determined definitely from the proofs.

30: That the plaintiff never appropriated the waters of the Connoquenessing Creek or Thorn Run or their tributaries in pursuant to charter rights and under any right of eminent domain, and never exercised any right of eminent domain in taking the waters of said stream or either of them; and never condemned said streams of any branch of tributary of the same; and never paid nor secured the payment of any damage that might result from the taking thereof to the owners of the land through which said streams flow; and that the plaintiff company has no other greater rights to the waters of said streams than as riparian owners; all of which said facts have been adjudicated by this Court in the Gas Company vs. The Water Company reported in 5 Superior Ct. Rep. 563.

Ans. The latter part of this request raises a question of law not of fact. The particulars as to action taken relative to the condemnation of lands and streams are stated in the general findings to which reference is made. As made and as a whole the request is refused.

31. There was no resolution of the board of directors of the plaintiff company appropriating any of the streams, no offer to agree with the upper riparian owners of land draining into Connoquenessing Creek, Thorn Run or any other tributary; or tender security made. The plaintiff company made no entry upon the defendant's lands and no such physical occupation of the streams themselves as would indicate any certain intention to take or continue in the permanent possession of the streams and water or to take such quantities as would work substantial damage to upper riparian owners.

Ans. This request covers several distinct propositions. The evidence discloses no resolution of the Board of Directors. With this modification the first part of the request is affirmed. It is also true

Digitized by Google

that the plaintiff company made no entry upon the defendant's lands, but it is found to be not true that the company took no such physical occupations of the streams themselves as would indicate a certain intention to continue in the permanent possession thereof. How the taking of water from a stream by a lower riparian owner could work substantial or any damage to upper riparian owners is not apparent.

32. That the Butler Water Company since about December 1, 1878, has been furnishing water from said Connoquenessing Creek to the inhabitants of Butler Borough, and is now furnishing water from said source suitable for domestice and other ordinary uses, in families, hotels and factories for domestic and steam purposes to the inhabitants of said Borough, and to private corporations, and to the municipality itself, for fire and for sewer purposes, and to the County of Butler for its use in the Courthouse and Jail. and to the railroad companies for use in their locomotives, and that there is no impurity therein caused by the defendant operators, and no recent complaint from any of said users about the water; that the taste of salt water is imperceptible by the consumers, and the water is not injurious to the consumers by reason of any salt that might be therein.

Ans. The first part of this request is affirmed, but the statement that there is no impurity in the water caused by the defendant operators is not approved. Whether or not there was at the time of the hearing, or had there been recent complaints about the water was not a fact in issue, nor was there special inquiry on the subject. It does appear, however, that some of them declined to use the water for drinking purposes. It was not then claimed that the salt in the water was perceptible to the taste, but analysis of the water then recently made showed the presence therein of chlorine in quantities largely in excess of that found in pure or ordinary water. Whether or not such quantity would be physically injurious to the consumer does not appear. One witness called by the defendants said he did not know the percentage of salt which would render drinking water injurious to health, but thought it would not be so if the salt were not perceptaible to the taste.

33. That the water of said stream was, long prior to the drilling of the wells of the defendants in question, complained of, and long prior to the use of the said streams by the plaintiff in 1878 and have ever since been impregnated by salt and brackish water from oil and gas wells drilled in said watershed from deer or salt licks in said watershed as well as sulphur and other brackish waters from coal mines, swamps and marshes, and that if the waters were or are impregnated as alleged by the plaintiff such impregnation is traceable to such sources and is not due to the defendants' wells as complained of.

Ans. Refused.

34. The weather in the summer and fall of 1908 was exceedingly dry. For a long time there was but little rain. One of the effects of the drought or a long period of dry weather on water is to increase the amount of percentage of mineral matter in it. In time of drought the process of evaporation being more rapid than during wet seasons and there being no increase by rain, a large percentage of mineral matters remains and cause the water to become harder. The moisture or watery part of the water would evaporate and the mineral part remain, therefore, the percentage of the mineral part increases.

Ans. Affirmed.

Digitized by Google

35. Water containing two hundred and ninety parts salt to one million parts water is not injurious to health of consumers. Salt in the water from the plaintiff's reservoir is not perceptible to the taste and water with salt not perceptible to the taste is not injurious to consumers.

Ans. Refused for want of evidence to support it.

36. That the salt water produced from the "hundred foot" sand cannot be relieved of its salt properties by subsidence, filtration or any other known process by the operator above draining it into the streams.

Ans. Affirmed.

37. That the plaintiff company is not an incorporated company possessing the right of eminent domain under the laws of the State of Pennsylvania; and which fact is essential to its rights to maintain this action; and that the Court cannot assume, without proof, that the same is a corporation.

Ans. The first part of this request is refused. The latter part is affirmed.

38. That the plaintiff company is furnishing large quantities of water to the town of Lyndora, the village of North Butler, and to the Buffalo, Rochester and Pittsburgh Railroad Company for use in its locomotives and round-houses, and that all these places are located outside the municipal district wherein said company is located, to wit: the Borough of Butler.

Ans. Affirmed.

Discussion and Legal Conclusions.

No question arises in this case as to the rights of upper riparian owners. The defendants are all owners and occupiers of land above the works and reservoirs of the plaintiff company. There has been no taking or diversion of water from them or from their premises. The complaint of the bill is that they have been infringing upon the rights of lower owners by contaminating and rendering impure the waters flowing from and over their premises to those below. The water which flows over and from their premises does not belong to them. "There is no such thing as ownership in flowing water. The riparian owner may use it as it flows. He may dip it up and become the owner of it by confining it in barrels or tanks, but so long as it flows it is as free to all as the light and air." Haupt's Appeal, 125 Pa., 211.

The facts relative to the appropriation of the waters of the streams in question are indicated with some detail in the foregoing findings of facts. As to some of the lower owners damaged by the diversion of the waters of the stream there has been a valid appropriation thereof, and they have been compensated in damages therefor. There may be others who were or are entitled to damages, or who have standing to object to the appropriation of the waters of the stream who have not been compensated. But if there be such, they are not parties to these proceedings. Since the act of appropriation by water companies, as by railroad companies, it is the act of the company, and the law makes no provision for a record thereof either by filing a draft or an instrument of appropriation, defining with precision the extent boundaries, location and purpose of the property taken, the evidence thereof is ordinarily in the keeping only of the

Digitized by Google

company exercising the right. Heise vs. Penna. R. R. Co., 62 Pa., 72. And since in this case no act of the company has been offered in evidence there is nothing to indicate the extent of the company's appropriation, except the records referred to, together with proof of the fact that for many years there has been an open appropriation of the waters of the stream, and there is now no complaint concerning such appropriation by anyone having status to object thereto. If occasion shall arise and appropriate complaint shall be made by lower riparian owners their rights will no doubt be determined, but in this proceeding they cannot. The plaintiff company must, therefore, be regarded as in the lawful exercise of its rights in using the waters of Connoquenessing Creek, to supply the inhabitants of the Borough of Butler with water in pursuance of its corporate duty. Gas Company vs. Butler Water Company 5 Sup. 563 cannot be regarded as an authority to the contrary since the complaint there made was by a lower riparian owner whose rights had been invaded by a diversion of water to the natural flow of which in the absence of a legal condemnation or purchase it was entitled over its premises.

Nor is the question raised by the pleadings one between private interests or persons acting only for and on behalf of themselves, such as arose in Coal Co., vs. Sanderson 113 Pa., 126; Collins vs. Chartiers Valley Gas Co., 131 Pa., 143; Pfeiffer vs. Brown et al. 165 Pa., 267, and other cases which might be cited. In the first of these cases it is said that "Every man has the right to the natural use and enjoyment of his own property, and if, while lawfully in such use and enjoyment without negligence or malice on his part an unavoidable loss occurs to his neighbor, it is *damnum absque injuria.*" In the second it is said that "the use which inflicts the damage must be natural, proper and free from negligence and the damage unavoidable." Following this in Pfeiffer vs. Brown it is said that "the right of the upper land owner to discharge water on the lower lands of his neighbor is in general a right of flowage only in the natural ways and natural quantities. If he alters the natural conditions so as to change the course of the waters or concentrate it at a particular point or by artificial means increase its volume, he becomes liable for any injury caused thereby." Citing Addison on Torts, Sec. 283, Ed. 1891. In this case it is held that where parties "by drilling a well and pumping increased the aggregate quantity of water discharged, concentrated it at an artificial point of flow and changed its character from fresh to salt whereby it becomes injurious" to land below, they were *prima facia* liable and that the burden of proof was upon them to show some reason why the general rule should not apply.

The defendants have endeavored to meet this burden by proofs of facts which would bring them within the exception to the rule recognized in Coal vs. Sanderson wherein it was held that "to encourage the development of great natural resources of a country trifling inconveniences to particular persons must sometimes give way to the necessities of a great community," and therefore that "the use and enjoyment of a stream of pure water for domestic purposes by the lower riparian owners, who purchased their land, built their homes and laid out their grounds before the opening of the coal mine, the acidulated waters from which rendered the stream entirely useless for domestic purposes, must *ex necessitate* give way

Digitized by Google

to the interests of the community in order to permit the development of the natural resources of the country and make possible the prosecution of the lawful business of mining coal." Syllabus Coal Co. vs. Sanderson.

If the pending case was one between the water company and the defendants the proofs and the facts found fail to bring it within the exception recognized in the case cited. The plaintiffs there suffered only a private inconvenience and the damage done was such as to affect them only and not the public. The defendant, on the other hand, was engaged in a lawful business in which it has made large expenditures and in which the interests of the entire community were concerned. It was held that the public interests should be conserved and that those of individuals should be subservient thereto. But in that case it was said: "We do not say that a case may not arise in which a stream from such pollution may not become a nuisance and that the public interests as involved in the general health and well-being of the community may not require the abatement of that nuisance," thus, in a way, foreshadowing the present controversy and intimating that even the great coal mining interests there involved might, under special circumstances, be suppressed in the interest of the greater community dependent upon waters contaminated by the mines. Here it cannot be said that the defendants occupy the same relation to the water company that the coal company did to the Sandersons. The situation is just the reverse. The public interest to be conserved here is the right of the community to an adequate supply of pure water, a prime necessity of life. The defendants are, it is true, developing the natural resource of the locality, but it is in a very limited way, the production and the net profits to be derived therefrom being necessarily small and the business being of no more importance to the community than various others involving a like investment of capital might be.

But this is not a case between the Water Company alone and the defendants. The Commonwealth at the relation of its Attorney General is a party. "The furnishing of water to the public is like the furnishing of light and heat for domestic purposes, a public use," Mills on Eminent Domain, Par. 18; the importance of which is recognized by the Legislative Department of the government in granting to the corporations organized to supply or provide for this public use authority to exercise, as the Representatives of the Commonwealth, the right of eminent domain. "By reason of this public interest in the business of the company, the state assumes a visitorial control over it, inquires into the quantity and quality of the water furnished by it and makes such orders as may be necessary to secure for the public a wholesome and an adequate supply. The business of the oil and coal operators is a private use. Such business has a certain relation to the general volume of business being carried on in the region, but it is not to be distinguished from the production or manufacture of other commodities in common use and that enter into the commerce of the country. Such operations may be begun or relinquished, increased or diminished at the will of the operator without public control or interference; but the supply of water, light and heat are necessary to the health and comfort of densely populated districts and is not left to the absolute control of the companies undertaking to provide. The state in the exercise of its police power as-

Digitized by Google

serts its right to inquire into the efficiency and good faith with which the public use is served, and to correct through the courts any defects or abuse in the conduct of the business of gathering or distributing the supply, or of securing a quantity of the commodity furnished that is suitable for use." Commonwealth vs. Russell, 172 Pa., 518. The issue here is between the defendants on the one side and a community of probably not less than 20,000 people of the other, and the interests to be considered are those of the defendants as hereinbefore described, and a limited number of others, probably similarly circumstanced, on the one hand and the public with its multiplied and varied interests and capital invested in homes, manufactories and transportation facilities, to say nothing of their health, security and well being, on the other.

The question raised by the pleadings, characterized in Comm. vs. Russell, is one of "very grave consequence," appears not to have been fully and authoritatively determined by the appellate Courts of the State, but the trend of reasoning found in the deliverances of the Court in the Russell case just cited, and that of Bryner vs. Water Company reported at Page 489 of the same volume, as well as the suggestion quoted from Coal Company vs. Sanderson, appear to be significant as indicating that in the opinion of that Court the weal of the public should be a controlling consideration rather than that of a small number of individuals engaged in private enterprise. To so rule incorporates no new principle into the body of the law since *Sic utere tuo non ali alienum laedas* but expresses an obligation which is inseparable from the organization of civil society.

The gravamen of the complaint against the defendants is not negligence. It is fundamental. Their right is challenged. The right of a riparian owner to pollute the waters of a stream which flows over his land is not among the privileges which belong to him either as a citizen of the State or of the United States. He must, unless he brings himself within some exception to the rule, permit the water to flow, subject to diminution of quantities for his reasonable use in its natural channels unpolluted to the lower owners, and a failure to do so is actionable.

Comm. vs. Emmens, 33 Sup. 151. To pollute water so flowing is a nuisance and for an actual nuisance there can be no excuse. Care and skill is no defense and equity will enjoin it at the suit of a private party. Rarich vs. Smith 5, D. R. 530. "Any diversion or obstruction of the water which substantially diminishes the volume of the stream so that it does not flow *currere solebatr* defiles and corrupts it to such a degree as essentially to impair its purity and prevent the use of it for any reasonable and proper purposes, to which running water is usually applied, such as irrigation, the propulsion of machinery or consumption for domestic use, is an infringement of the right of other owners of land through which a water course runs and creates a nuisance for which those injured thereby are entitled to a remedy." Merrifield vs. Lombard, 13 Allen (Mass.) 16; 90 Am. Dec. 172.

As hereinbefore indicated in the quotation from Comm. vs. Russell it is in the exercise of its police powers that the State intervenes in such cases on behalf of the public. Such being the case and since no action lies against it, the Commonwealth, for damages, it would

Digitized by Google

appear to be immaterial under the facts found whether the wells in question were drilled before or after the location of the reservoirs. If the public interest requires it their owners will be enjoined without reference to that fact. In this connection, however, it should be noted that with possibly one exception (one of the Bowers wells) the wells concerning which complaint is made were all either drilled since the location of the reservoirs or were put in operation by the defendants after their respective purchase of them. The investments were therefore made by them in the face of knowledge of the situation and that their right to operate them in the manner in which they have been operated would be challenged. This tends to mitigate any apparent hardship which may result to them by reason of the conclusion reached therein and the decree which follows.

It may further be remarked that if no other wells than those concerning which complaint is now made were drilled in the vicinity the evils complained of might continue for a time without reason to apprehend special danger or inconvenience except during the dry season of the year, and the flow of salt water might gradually decrease. But if this were permitted and the way clear for general developments in the particular field it is but reasonable to conclude and assume that within a comparatively short time the entire basin would have to be abandoned as a source of supply by the plaintiff company. This fact was recognized in Bryner vs. the same company, supra, when in commenting upon a like determination that the defendant (here the Water Company) and the public are alike remediless, and that the pollution of the stream must go on without check or regulation by the Courts, just so long as it may suit the landowners to pump salt water into it. The result will be the practical confiscation of the entire plant of the water company and of the natural water supply for ten (now twenty) thousand people, for the benefit of a few persons. In this event the company may be compelled by its own necessities to elect whether it will go out of business or seek some new and independent source of supply."

PLAINTIFF'S REQUESTS FOR CONCLUSIONS OF LAW AND ANSWERS THERETO.

1. The pumping of salt water by defendants from their wells which then finds its way into the Boydstown and Thorn Run reservoirs of the Butler Water Company to the extent proven in this case, is a public nuisance per se, and the public interests require the abatement of the nuisance.

Ans. Affirmed under the circumstances covered by the facts found.

2. While it may be true that a mere trifling, personal, private inconvenience must yield to the necessities of a private enterprise subserving a public interest, such as the oil business, and that lower riparian could not recover for such inconvenience, yet where in this case the nuisance is a public one it should not be continued for private gain. The rights of the public are superior to those of individuals.

Ans. Affirmed.

3. The fact that the water furnished by the Butler Water Company is not absolutely pure is no excuse for the contamination of the streams by defendants. It may have been contaminated somewhat

Digitized by Google

by water from coal mines, by salt water from oil wells, or by other causes, but if it was fit for boilers and for domestic use, though not chemically pure and was safely used by the public, and if the defendants by pumping additional salt water into it contributed such impurities to it as substantially to impair the value of the water for the ordinary purposes of life and rendered it measurably unfit for domestic or industrial purposes or impaired its comfortable or beneficial enjoyment, it is no answer to the public that it had previously been contaminated. Adding such impurities by the defendants is a public nuisance which should be enjoined.

Ans. Affirmed.

4. The State having intervened in this case, the rights of the public are involved and the rights of the plaintiffs are not to be measured by the rights of the riparian owners.

Ans. Affirmed.

5. Whether the Butler Water Company might by abandoning the use of Thorn Run and Connoquenessing Creek and by drilling wells obtain a new and better supply of water, is not involved in this case. The question at issue is the right of the parties to the bill in those streams.

Ans. Such question is not involved as a controlling one. It is incidently involved and proper for consideration in connection with and as a part of the general situation. As thus qualified the request is affirmed.

6. The rights and duties of the defendants are measured by those of riparian owners and as against the rights of the public, it is the duty of the defendants to so use their property as not to impair the water of the flowing streams so that it becomes unfit for domestic or industrial purposes.

Ans. Affirmed.

7. Under the facts in this case it is no excuse for pumping salt water in the streams that it is too expensive to save the small amount of oil produced to pipe the salt water below the reservoirs of the Butler Water Company, the comfort and health of a large community and the industrial welfare of the public are not to be put in jeopardy for a trifling pecuniary gain to individuals.

Ans. Affirmed.

8. Under all the facts in this case the defendants should be restrained from polluting the streams from which the people of Butler take their supply of water.

Ans. Affirmed.

DEFENDANTS' REQUESTS FOR CONCLUSIONS OF LAW AND ANSWERS THERETO.

1. The defendants have the right to the natural use and enjoyment of their own property and if while lawfully in such use and enjoyment without negligence an unavoidable loss occurs to the plaintiff, it is *damnum abseque injuria*. Where conflict is irreconciliable the right of the defendants to use their own property must prevail.

Ans. Affirmed as a general proposition applicable to controversies between individuals.

Digitized by Google

2. The right of eminent domain is one arising only on the basis of necessity. The plaintiff can furnish a necessary supply of water to properly serve the people of Butler in other ways without depriving the defendants of the use and enjoyment of their property, even if more expensive, it cannot interfere with or disturb the defendants in the pursuit of their lawful business in a lawful way. There must be a necessity arising from the very nature of things over which the plaintiff has no control, it must not be a necessity created by the company itself for its own convenience or for the sake of economy.

Ans. As applicable to the facts in this case this request is refused.

3. The expense of preventing the damage from the salt water finding its way into the tributaries of the stream supplying the plaintiff's reservoirs with water, is such as practically to counterbalance the expected profit or benefit from the wells, and it is clearly unreasonable and beyond what the defendants could justly be called upon to assume, and is not an injury which will sustain an action. Pfeifer vs. Brown 165 Pa. 267.

Ans. Refused.

4. The plaintiff is selling and furnishing water from its reservoir to the hotels, families and people of Butler for cooking, drinking and other purposes, which water does not exceed two hundred and ninety parts salt to one million parts water. The taste of the salt therein is not perceptible or injurious to the health of the consumer, and is not such pollution as contaminates or injures the water sufficiently to warrant an injunction as prayed for by the plaintiff.

Ans. Refused.

5. The plaintiff being a corporation under the laws of this Commonwealth, with power of eminent domain has not exercised that right of condemning the property of the defendants and paying for securing to them just compensation for the property taken, injured or destroyed as required by law, therefore, the Court cannot in this proceeding restrain or enjoin the defendants as prayed for. Plate Glass Company vs. Butler Water Co., 5 Sup. Ct. Rep. 563.

Ans. Refused.

6. This being a proceeding in equity the plaintiff company must establish a clear equitable right to the remedies by perpetual injunction which it seeks.

Ans. Affirmed.

7. In equity a decree is not of right but of grace and a chancellor will refuse to enjoin if in conscience it appears he would do greater injury by enjoining them by leaving the party to his redress by a Court and a jury. Richards Appeal, 57 Pa. 105. Huehenstein's, 70 Pa. 102.

Ans. Affirmed.

8. A court exercising a power of a chancellor, whose arm may fall with pressing force upon the everyday business of man, destroying lawful means of support and diverting property from legitimate uses, cannot approach such a case with too much caution. Hückstein's Appeal Supra.

Ans. Affirmed.

9. The effect of the injunction asked for in this case would be, in a large measure, to sweep away the money invested by the defendants and others operating for oil in the same territory, and prac-

Digitized by Google

tically to confiscate for all time to come for the use of the Butler Water Company the oil right in the whole watershed of the Connoquenessing Creek and Thorn Run above their reservoir, and to deprive the land owners on the watersheds of said creek the legitimate and natural use of their land in effect to deprive them of their property without trial by jury and without compensation.

Ans. Refused.

10. The doctrine in Pennsylvania that the complainant must first establish his right at law, where it is doubtful before he can seek an injunction, goes to the jurisdiction and may be raised by the Court itself at any time, though not raised by the pleading. Beach on Injunctions Vol. 2, page 1038.

Ans. Affirmed.

11. Even if the allegations of the plaintiff's bill that the water of the said creek were pure and wholesome and sufficient in amount until contaminated by the defendants' oil operations were true, yet the plaintiff would not be entitled to an injunction for the reason that the injury is not irreparable, but as the testimony discloses, other sources of supply than said creek are shown to be within the plaintiff's reach at reasonable expense.

Ans. Refused.

12. While equity has jurisdiction to restrain a public nuisance upon the information of the Attorney General either on behalf of the State or at the relation of an individual, yet injunctions have often been refused where it appears that the information was not brought in behalf of the public, but merely at the relation of private parties who might themselves have instituted the suit if they had sustained any special injury. Beach on Injunctions, Vol. 2, Sec. 1,078.

Ans. Affirmed as being an historical statement which the authorities will no doubt sustain but not relevant to the pending case.

13. "It is not more agreeable to the laws of nature that water should descend than it is that land should be farmed and mined." Kaufman vs. Griesemer, 26 Pa. 414.

Ans. The case cited so rules and we must assume the proposition is correct. The request is affirmed.

14. It must be conceded, we think, that every man is entitled to the ordinary and natural use and enjoyment of his property. He may cut down forest trees, clear and cultivate his land, although in so doing he may dry up his neighbor's spring. If in the excavation of his land he should uncover a spring of water, salt or fresh, acidulated or sweet, he will certainly not be obliged to cover it again or conduct it out of its course lest the stream in its natural flow may reach his neighbor's land. Pa. Coal Co., vs. Sanderson, 113, P. S. R. 145.

Ans. This is simply an excerpt from the opinion of the Court in the case cited. Of course its correctness must be assumed in the connection and case in which it was used, but it is not regarded as applicable to the facts in this case.

15. It has always been considered that land on a lower level owes a natural servitude to that on a higher land in respect to receiving without claim or compensation by the owner, the water naturally flowing through it. Ibid Page 145.

Ans. As a general statement of the law taken from the case cited this is affirmed but it is not applicable to the facts of this case.

Digitized by Google

16. The fact that by reason of the defendants' oil operations salt water found its way into the Connoquenessing Creek and Thorn Run its natural channel, its presence there is not a public nuisance, per se. Coal Co. vs. Sanderson, Supra.

Ans. Refused. But, if the request be technically correct it is not controlling in this case.

17. Even if there were an issue directly between the inhabitants of Butler and the defendants, yet the defendants would not be enjoined as the proofs show an abundance of supply of good water within reach of all by drilled wells at reasonable expense.

Ans. Refused.

18. If this were a case between the defendants and a single individual, a citizen of Butler, who it was shown could furnish himself with a sufficient supply of water for all purposes, by drilling a well on his own premises at a reasonable expense, equity would not enjoin. An aggregation of individuals called the public with the same means of supplying itself with water would not be entitled to any greater relief.

Ans. Refused.

19. The plaintiff is not entitled to an injunction as prayed for.

Ans. Refused.

20. There being no evidence of the incorporation of the plaintiff company under the laws of the State of Pennsylvania, it therefore cannot maintain this action. Bly vs. White Deer Mountain Water Co., 197 Pa. 80.

Ans. Refused. There is evidence of the incorporation of the plaintiff company.

21. That if the plaintiff company is duly incorporated, section 34 of the act of 1874, which grants to water companies the power to supply water in "the town, borough or district where they may be located" limits the authority of the plaintiff company to the Municipal division where it is located, to wit: the Borough of Butler.

Neither the power of eminent domain granted by the Act of 1874, nor any other provision of the Act of 1874 nor any provision of the Act of May 16, 1889, or the Act of July 2, 1895, give to water companies the power to supply water in the territory adjacent to the municipal or quasi municipal division in which they are located.

A provision in the certificate of incorporation granting power to supply water in adjacent territory is wholly imperative and such a certificate should not have been approved by the Governor.

As a water company has no right to supply water in territory adjacent to the place in which it is located it has no authority under the right of eminent domain to condemn and appropriate water for such purposes.

There can be no authority or power conferred upon a corporation by the certificates or letters patent, except such as clearly given by or necessarily implied from the language of the statute under which they are granted. Equally true is it that the rights and privileges of a corporation must be written in the charter or they do not exist.

When a corporate body asserts its right to do a thing, or to deprive an individual of its property even for an adequate compensation, it must be able to show that the right is conferred by the plain

Digitized by Google

and unequivocal language of its charter. Bly vs. White Deer Mountain Water, Supra.

Ans. As applicable to the facts of this case, refused. It related to a question not in issue and not material to a determination of the issue upon its merits.

The foregoing indicate the views of the Court upon the legal questions involved in this controversy and the reasons which have led to the general conclusion which follows: to wit:

Under the facts found and the law an injunction should issue as prayed for in the plaintiff's bill of complaint and the defendants should pay the costs.

And now October 19, 1909, it is ordered that the foregoing findings and conclusions to filed and that the Prothonotary enter a decree *nisi* in accordance therewith and give notice to the parties or their counsel.

GEORGE S. CRISSWELL, P. J.

28th Ind. Dist. Pa. Specially presiding.

OPINIONS OF THE ATTORNEY GENERAL.

After the passage of the new fish code of May 1, 1909, various questions arose as to the interpretation of the provisions of this act and these questions were submitted to the Attorney General with a request that he give authoritative opinions thereon. One question that arose was in regard to the location of a fish basket for taking eels. The law provides that no fish basket shall be erected within a quarter of a mile above another basket already located, but in one case a man desired a license for a basket less than a quarter of a mile below another one already located. In this case the proposed basket interfered with no one's rights because if there was any interference it would be with a man who wished to place the basket and he was willing to run his chances. The Attorney General decided that the man could obtain the license if he so desired.

The question of trout streams is one of much importance. Eel baskets under the law cannot be placed in streams known as trout streams. There are a number of streams in the state which contain trout in the upper waters but apparently none in the lower part where the water has become warm, excepting perhaps very early in the season. The law provides that in case of a question arising as to how much of a stream is a trout stream it shall be decided by the Fishery Commission after hearing witnesses. The Attorney General's opinion is that where a stream is popularly known as a trout stream no basket can be licensed for its entire length until the Fishery Commission has decided where it ends as a trout stream.

There have been several instances in the State where persons have represented themselves as fish wardens and by threatening the arrest of fishermen have succeeded in getting from them various amounts of money, either because the parties did not want the notoriety of arrest, or to avoid the trouble of going before a Justice.

Digitized by Google

Efforts have been made by this Department to secure the arrest of these people and in some instances it has succeeded. Under the opinion of the Attorney General any person who represents himself falsely as a fish warden is liable to arrest and punishment, and the Department will be glad for any information that will lead to the arrest and conviction of any such blackmailers.

IMPERSONATING AN OFFICER.

Office of the Attorney General,
Harrisburg, Pa., August 7, 1909.

Hon. W. E. Meehan, Commissioner of Fisheries,
Harrisburg, Pa.

Dear Sir: Your favor of the 3rd instant is at hand, in which you ask whether there is any law under which your Department can prosecute a man in Warren County who represented himself to be a fish warden, and who, so personating the warden, took from three men thirty dollars, and at other times as low as two dollars and a half.

If the man obtained money by representing that he was a fish warden with intent to cheat and defraud the persons from whom the money was obtained, he can be convicted for obtaining money by false pretenses, under the criminal code of this State.

The Act of May 5, 1897, (P. L. 39) provides "that any person within the Commonwealth of Pennsylvania who falsely represents himself to be, or who falsely assumes to act as an appointive officer of the Commonwealth of Pennsylvania, or any county, municipality, city, borough, township, district or ward within the Commonwealth of Pennsylvania, shall be guilty of a misdemeanor, and upon conviction thereof be sentenced to pay a fine," etc.

The Act of 1901, relating to your Department, in Section 43 refers to fish wardens as *holding office,* and in Section 44 requires each warden to keep a record of his *official* acts. They are given the same powers as constables in enforcing the fish laws, and constables are officers who can be personated within the meaning of the Act of 1897. The conclusion is irresistible that a fish warden is an "appointive officer of the Commonwealth of Pennsylvania" within the terms of the Act of 1897 above referred to.

Therefore, you are also advised that if the man referred to represented himself as a fish warden obtaining money thereby, prosecution can be maintained under the Act of 1897.

Very truly yours,

(Signed) WM. M. HARGEST,
Assistant Deputy Attorney General.

Digitized by Google

LOCATION OF FISH BASKETS.

Office of the Attorney General,
Harrisburg, Pa., August 7, 1909.

Hon. W. E. Meehan, Commissioner of Fisheries,
Harrisburg, Pa.

Dear Sir: Your communication of the third instant is at hand, in which you ask to be advised whether provision of Section 8, of the Act of May 1, 1909, (P. L. 353) permits the licensing of a location for a fish basket and wing walls below another location already licensed, and within a quarter of a mile of latter.

Section 8 of the Act to which you refer provides "And no baskets and wing walls shall be set immediately *above* one already legally located nearer than a quarter of a mile."

I understand from you verbally that the reason for this provision is to protect the owner of a licensed location from the damage which would result in placing wing walls and a basket such a short distance above one already located, as to interfere with its usefulness, and that this provision is largely for the benefit of the holders of the licenses, and a provision in which the policy of the State is little concerned.

Your verbal explanation indicates the intention of the Legislature. To place a basket *below* a location already licensed would not interfere with the upper location, and inflict no injury on the holder of the license of the upper location. The licensing of a lower place within a quarter of a mile is not prohibited by the language of the act. This section being restrictive and prescribing a penalty for its violation must be construed strictly.

You are, therefore, advised that under Section 8 of the Act of May 1, 1909, above referred to, a license can be granted within a quarter of a mile *below* a location already licensed.

Very truly yours,

(Signed) WM. M. HARGEST,
Assistant Deputy Attorney General.

Digitized by Google

BASKET LICENSES IN TROUT STREAMS.

Office of the Attorney General,
Harrisburg, September 20, 1909.

Hon. W. E. Meehan, Commissioner of Fisheries,
Harrisburg, Pa.

Dear Sir: Your favor of the 8th instant, supplemented by your favor of the 17th instant, is at hand.

Upon the facts therein stated, an opinion is requested, first,

Whether a license can legally be issued for a fish basket in a stream in which charr or trout are commonly fished for and caught, before the Board of Fishery Commission has officially declared the portion of the stream for which the license is requested, not inhabited by trout.

In Section 8 of the Act of May 1, 1909, (P. L. 353), entitled "An Act to classify the fish in the waters within this Commonwealth; declaring which are game fish and which are food fish," etc., it is said "and no fish basket shall be set or used in a stream known as a trout stream."

Section 28 provides:

> "That for the purpose of this Act, any stream or water *or part thereof,* within this Commonwealth, in which charr or trout, are commonly fished for and caught, whether through the stocking of the stream, or whether native to such stream or water, or part thereof, shall be deemed water or stream inhabited by trout. In case of a conflict of statement on this point, as to any stream or water, the matter shall be investigated by the Board of Fishery Commission and its decision shall be final."

Larry's Creek, Lycoming County, has both been stocked by the State and by private persons with brook trout, and you state that so far as your Department is advised, Larry's Creek is a trout stream from one end to the other, and there has been no request for an investigation by the Board of Fishery Commisison, and no determination by that Board as to whether Larry's Creek is inhabited by trout or not. It has two forks and in both of the forks, according to the records of your office, trout are fished for and caught. You also state that in one letter your correspondent says there are no trout below Salladasburg.

For the purposes of issuing a license, the language of Section 8 "known as a trout stream" and the language of Section 28 "inhabited by trout," ought to be construed to mean the same. If trout are commonly fished for and caught, the stream must be known as a trout stream. Applying Section 28 to Larry's Creek, it appears that trout are commonly fished for and caught in a part thereof, and it also appears that the stream or parts thereof have been stocked. It further appears that the stream, so far as information has come to your Department, is known as a trout stream.

Digitized by Google

You are therefore advised that the County Treasurer cannot legally issue a license for a fish basket in a stream if trout are commonly fished for and caught in any part of said stream, until the Board of Fishery Commission has first determined that the portion of the stream wherein the fish basket is to be set or used is not inhabited by trout.

Second; you also ask to be advised if a County Treasurer issues a license for a fish basket to be set and used in a part of the stream upon an allegation that such part does not contain trout, whether such license is binding on the Department of Fisheries. You are hereby advised that the license is binding on the Department of Fisheries so long as it is outstanding, to the extent of protecting the person who places or sets a fish basket, pursuant to said license. The issuance of such a license, however, is not binding on the Department of Fisheries, as fixing, as a matter of fact, that such portion of the stream is not inhabited by trout. The Department of Fisheries can determine independently of whether a license is issued or not, whether or not a stream is inhabited by trout.

Third; you also ask to be advised whether it is your duty to return the check to the County Treasurer where the license is granted for a part of a stream which is known to contain trout. It is your duty to return the check to the County Treasurer, with a request to cancel and revoke the license.

Fourth; you further ask to be advised whether, if a license is issued by a County Treasurer for a fish basket in a stream, known to be inhabited by trout, such license is binding on the Department so as to prevent it from prosecuting the licensee. Such a license does not prevent a successful prosecution, but in that case the County Treasurer ought to be promptly requested to revoke the license and the licensee notified to remove the fish basket.

Very truly yours,

(Signed) WM. M. HARGEST,
Assistant Deputy Attorney General.

Digitized by Google

INDEX.

	Page.
Arrests for Violation of the Law,	9,151
Abandonment of Goldfish Work,	48
American Fisheries Society,	50
Allowances of Appeals under Act of May 29, 1907, unconstitutional,	163
Attorney General's Opinions,	196
Board of Fishery Commission, Report,	5
Brook Trout from Commercial Hatcheries,	21
Bellefonte Hatchery,	29,95
Battery House, New at Erie Auxiliary,	31
Black Bass Season,	44
Bellefonte Hatchery, Report of,	95
Black Bass Work,	109
Bass Reared to Adults,	111
Commercial Fish Industry in Lake Erie,	15
Commercial Hatcheries,	20
Commercial Hatcheries, Brook Trout Returns,	21
Commercial Fish Business in the State,	22
Carp Industry,	23
Corry Hatchery,	28,84
Cannibalism,	32
Crawford Hatchery,	32,132
Commodore Perry,	35,147
Car Ferry Foundered, Boat Picked up,	36
Corry Hatchery, Report of,	84
Car Barn,	100
Cut-Throat Trout,	112
Crawford Hatchery, Report of,	132
Chief Warden's Report,	151
Constitutionality of Act of May 29, 1901,	164
Drought in Pennsylvania,	8,38
Drought at Wayne Hatchery,	30
Drainage System at Torresdale,	31
Drought at Crawford Hatchery,	32
Distribution of Seized Fish,	36
Delaware River Laws,	57
Eel Industry,	17
Eel Industry, Return of Catch,	19
Erie Hatchery,	28,88
Electric Lights Installed at Torresdale Hatchery,	31
Erie Auxiliary Hatchery,	31,127
Erie City's Tribute to Crew of Commodore Perry,	37
Erie Hatchery, Report of,	88

Digitized by Google

Page.
Erie Auxiliary, Report of, ... 127
Financial Statement, ... 24
Field Work, ... 33,107
Fish Car, ... 34,100
Fisheries Commission Tribute to Heroism of Captain Driscoll and Crew, . 37
Fish Exhibit, ... 38
Fresh Water Terrapin, ... 47
Fish Baskets, ... 48,157
Fishways and Screens, ... 50
Fish Code, ... 59
Frogs and Terrapin, Legislation for, ... 63
Fish Distribution, Corry Hatchery, ... 85
Fish Distribution, Erie Hatchery, ... 92
Fish Distribution, Bellefonte Hatchery, ... 110
Fish Distribution, Wayne Hatchery, ... 114
Fish Distribution, Torresdale Hatchery, ... 122
Fish Distribution, Erie Auxiliary Hatchery, ... 129
Fish Distribution, Crawford Hatchery, ... 140
Fish Distribution, Spruce Creek Hatchery, ... 146
Fish Baskets in Trout Streams, ... 162
Free Streams, ... 166
Fish Baskets, Location of, ... 198
Fish Baskets Licenses in Trout Streams, ... 199
Goldfish Breeding Abandoned, ... 48
Gigging should be Prohibited, ... 61,156
Hatcheries, Itemized Expenses of, ... 26
Heroism of Crew of Commodore Perry, ... 35
Indifference of Licenses for Fish Baskets, ... 10
Increase of Commercial Fish Industry in Lake Erie, ... 15
Increased Output from New York, ... 27
Interstate Legislation, ... 52
Interstate Conference on Pollution of the Ohio, ... 56
Impersonating an Officer, ... 197
Letter of Transmittal, ... 3
Low Water at Wayne Hatchery, ... 30
Lake Trout Pond at Spruce Creek Hatchery, ... 33
Life Saving by Commodore Perry, ... 35
Local Organizations, ... 52
Legislation, Inter-state, ... 52
Laws for the Delaware River, ... 57
Location of Fish Baskets, ... 198
Mayor of Erie to Crew of Perry, ... 37
Need of more Help, ... 12
New Ground at Corry Hatchery, ... 28
New House at Erie Hatchery, ... 28
New Hatching House at Bellefonte Hatchery, ... 29
New Pond at Wayne Hatchery for Yellow Perch, ... 30
New Pond at Crawford Hatchery, ... 32
North American Fish and Game Protective Association, ... 51
New Fish Code, ... 59,155
Navigable Waters, A Question of, ... 67
Officers of the Department, ... 1
Officer of Steam Tug Perry, ... 1
Outputs, ... 13
Opinions of the Courts, ... 162
Opinions of the Attorney General, ... 196
Presque Isle Peninsula, ... 12
Proposed Fish Hatchery at Presque Isle, ... 41

Digitized by Google

Page.
Presque Isle Peninsula Fish Hatchery, ... 41
Pollution of the Ohio, Interstate Conference, ... 56
Purification of the Streams, ... 64
Power Dams, ... 71
Pollution of Streams, ... 158
Public Welfare Greater than Private Interests, ... 170
Report of Board of Fishery Commission, ... 5
Report of Commissioner of Fisheries, ... 13
Returns of Eel Industry, ... 19
Returns of Commercial Hatcheries, ... 20
Report of Commissioner on Interstate Legislation, ... 53
Reports of Hatchery Stations, ... 84
Rainbow Trout, ... 97
Rescues by Commodore Perry, ... 148
Superintendents of Hatcheries, ... 1
Small Eels Caught, ... 17
Shad Returns in the State, ... 23
Spruce Creek Hatchery, ... 33,142
Silver Salmon at Spruce Creek Hatchery, ... 33
Siezures by Commodore Perry, ... 35
Silver Side Salmon, ...45,98,112
Sturgeon Culture, ... 46
State Organizations, ... 51
Sunfish as a Game Fish, ... 62
State Boundary Waters, International Control, ... 64
Superintendents Meetings, ... 72
Shad Work, ... 118
Spruce Creek Hatchery, Report of, ... 142
Torresdale Hatchery, ... 31,117
Tribute to Captain Driscoll and Crew, ... 37
Terrapin Culture, ... 47
Torresdale Hatchery, Report of, ... 117
Trout Streams, Fish Basket Licenses in, ... 199
Usefulness of the "Commodore Perry," 11
Value of Artificial Propagation, ... 7
Wardens, too few, ... 10
Work in the Hatcheries, ... 27
Wayne Hatchery, ... 30,105
Well at Wayne Hatchery, ... 30,106
Wayne Hatchery, Report of, ... 105
Wall-eyed Pike, ... 112

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google