

OREGON'S CENTRAL STATE HATCHERY LARGEST FISH PLANT IN THE WORLD

Huge Institution at Bonneville Will Care for 15,000,000 Salmon and Trout Eggs Each Year—Ultimate Capacity Will Be More Than Double That—Raising Young Fish Is Interesting Operation.



Bonneville Hatchery



Rack And Upstream Trap On Salmon River.



Herding The Young Fish Into One End Of Covered Nursery Pond While Other End Is Drained

IMPROVEMENTS and additions recently completed make Oregon's Central State Hatchery at Bonneville the largest in the world. A total of 15,000,000 salmon and trout eggs were taken care of at the hatchery in 1911. Twenty million eggs will be hatched and reared during 1912, and the final total capacity of the plant, when nursery ponds now projected are completed, will be 41,000,000.

The former capacity of the hatchery was but 8,000,000 eggs. Acting under instructions from the State Board of Fish and Game Commissioners, Master Fish Warden Clanton had constructed a flume which has a capacity of 25,000 gallons per minute, or the minimum flow of Tanner Creek during the summer months. This is the stream which supplies the hatchery with water from a quarter of a mile up the creek in the hatchery buildings, where it is liberated into a series of ponds, flowing from one to the other and forming a series of cascades. In these ponds the young fish are to be nursed and fed from the time they are old enough to be removed from the hatching troughs until they are liberated.

Hatchery More Than Ten Years Old.
The Bonneville hatchery was established in September, 1905, with H. C. McAllister as master fish warden and J. W. Berran as superintendent. E. Greenman, the present superintendent, who was then inspector of hatcheries, personally delivered the first lot of eggs at the hatchery. They were taken ten days before the plant was ready for operation, and it was therefore necessary to hold them in cold storage at the Union Depot in Portland for that length of time. They had been brought from the Salmon river racks.

Though the Bonneville hatchery is the principal one at present, it was not the first one established in the state. The first one was built in the early '80s near the mouth of the Clackamas River, and was operated jointly for a few years by the state and Government. It was finally abandoned and the lower river cannerymen erected a hatchery on the headwaters of the same stream. The main building of the central hatchery is 240 feet in length by 50 in width. In addition to the office and exhibit rooms, it contains 140 16-foot troughs with a capacity of 150,000 eggs each, or a total of 41,000,000. This building and the hatching troughs are supplied with a pipeline flowing 1000 gallons per minute.

Eggs Received From Government.
No eggs are taken at this hatchery. They are secured from the Government and from some of the collecting stations in different parts of the state. At these stations the streams are raked and the fish held until "ripe." The salmon are then taken from the water and killed. Their tails are cut off and the fish allowed to bleed for five or ten minutes, when their bellies are split open with a sharp knife and the eggs are allowed to drop into spawning pans. They are then fertilized by the male fish which are kept in pens handy. The milt is washed off and the eggs taken to the hatchery, where they are sorted with nippers, until the third day, after which they are allowed to rest for ten days or two weeks. The eggs are then sorted daily and all the stations on the streams are prevented the starting of a fungus growth on the live eggs, which is one of the

Tanner Creek With Section Of Flume Carrying 25,000 Gallons Of Water Per Minute.

hardest things with which the hatcheryman has to contend. After the eggs are hatched, the troughs are spaced off and from 2000 to 4000 of the fry are kept in a space two feet long by 14 inches wide. Every day the young fish are carefully sorted, all dead or ill-shaped ones being removed. Great care is taken to keep the troughs perfectly clean. Indeed, the entire hatchery is kept as "spic and span" as a Government lighthouse or a "man-o-war."

Six weeks after they are hatched, or when the young fish are about one inch in length, they begin to swim up to the surface of the water for food. They are then placed in ponds and the feeding process begins. With the exception of trout and steelheads, no food is given until the yolk sack is absorbed. In the case of these varieties, food is given when the yolk sack is but half absorbed.

Fishlings Fed Often.
At first the fish are fed five or six times daily, as the youngsters will not take any food that is not floating. Later, after the yolk sack is entirely absorbed and the young fish are accustomed to feeding, they will take food from the bottom of the ponds, when it is not necessary to feed more than four times a day.

One of the most necessary points in connection with the artificial propagation of fish is to keep the troughs and ponds absolutely sanitary to prevent the breeding of fish diseases, chief of which are fungus growth and gill trouble. As the gills are to the fish what the lungs are to the human being, anything which injures the gills injures the entire fish. The fungus is a gelatinous growth which forms on the backs and sides of the young fish. To treat either of these troubles is a most delicate and difficult task. The diseased fish are first separated and are then given salt baths every three days, with mud and clay baths in between.

Though ground river is considered the standard food for young fish the world over, it is supplemented in Oregon by smelt, eels and canned salmon heads, tails and entrails. The eels are secured by the millmen at the falls of the Willamette at Oregon City, the smelt are taken from the lower Columbia tributaries and the canned sal-

mon are supplied by the cannerymen, the state furnishing the cans while the cannerymen do the rest. Much is also fed the young fish occasionally. All of the food is ground exceedingly fine and mixed with water until it forms a thick soup when it is thrown onto the surface of the ponds by means of wooden paddles.

Liberated When Year Old.
During the early stages, the fish are confined in great numbers in very small spaces, but as they grow they are thinned out and the longer they are kept the greater space is required to handle them. It is the plan of the present administration to hold them until they are about a year old, when they are marked and liberated.

The present system of marking is to clip a V-shaped piece from the gill cover. At first glance it will probably seem like an impossible task to undertake the marking of a few million fish of the fingerling stage. According to Superintendent Greenman, however, one man can, with the use of an instrument invented by Master Fish Warden Clanton, mark about 2000 fish in a day. The purpose of the marking is to determine more or less accurately the percentage of fish which are permitted to come to maturity and return to the streams in which they have been liberated. With the exception of Japan, Oregon is the only place in the world where gill marking is employed. The Government inserts a silver wire in one of the fins whereas formerly it was the custom to cut off the adipose fin. It was found, however, that this fin often grows out and in cutting it off there is also danger of killing the fish.

About 70,000 salmon fry thus marked were liberated from the Bonneville hatchery in September. Six weeks later Master Fish Warden Clanton made a cruise down the Columbia River and had no trouble in finding the marked fish in practically every eddy along the stream, down as far as the mouth of the Willamette.

Most Salmon Die After Spawning.
The salmon are supposed to attain maturity at the age of 4 years when they return to the rivers to spawn. With the exception of the steelhead, which is generally conceded to be a trout, the salmon die after they have

spawned. Making no effort to return to the sea or to take food, they gradually die or starve, or wear themselves out on the shallows of the stream headwaters. The steelhead returns to the sea, however, whenever he is able and comes back to spawn in succeeding years. So far as is known, the oldest steelhead ever taken was 7 years old. This is determined by counting the rays or lines on the fins by aid of a microscope, but as this was but recently discovered, the extent of the observations is very limited and the theory has not even been perfected.

According to Superintendent Greenman, the old system of liberating the fry when they were only about one inch long, resulted in a return of from 2 to 3 per cent, according to the best estimates obtainable. Under the plan now being tried by the state of keeping the young fish until they attain the "fingerling" stage, which is reached at about one year of age, it is hoped to increase the percentage of return to fully 10 per cent. It is believed by keeping the fry until they are four or five inches in length they will be better able to get out of the way of their innumerable natural enemies and be able to secure a better food supply.

Fish Are Carefully Studied.
Very close observations are being made by Master Fish Warden Clanton and the hatcherymen under him. The young fish are being carefully weighed and measured, different foods are being tried and climatic conditions studied in an effort to find out what kind of food the baby fish thrive best and to determine why and what the fry start for the ocean. The latter information is particularly desired as it is feared it may be possible to keep young fish too long for the ocean.

Superintendent Greenman avails himself of his personal observation, it makes no difference how tame the fish may become in the nursery ponds, they are wild as the wild ones are liberated. Ten million salmon and 1,000,000 trout eggs have recently been hatched

at Bonneville. Of this number 8,000,000 were chinook and were secured from the Government station at Little White Salmon. Two million are Alaska bluebacks and were also furnished by the Government. The 1,000,000 trout eggs are of the Eastern brook variety and were purchased by State Game Warden Finley while in Rhode Island on the occasion of his recent tour of the Eastern States to study the methods of game and fish protection and propagation in use there.

Chinook Best Quality.
The blueback or sockeye salmon is regarded as next to the chinook in point of quality. The silverides comes next, then the steelhead and lastly comes the dog salmon, which finds every little favor in the eye of either canneryman or consumer.

Aside from the central hatchery at Bonneville the state has branch hatchery stations on the Willamette River, near Rondo; on the Santiam, on the Middle Fork of the Willamette, on the Sandy River, on the Trask River, near Tillamook; on South Coast River, near Marshfield; on the Simlaw, on the Alsea quins, near the city of Astoria; on the River, on the Umpqua and on the Coquille.

Superintendent Greenman, in charge of the Bonneville hatchery, is regarded as one of the best salmon hatcherymen in the country. He took up the work in 1896 and has been engaged since some branch of it continuously since that time. He was first employed by the Government, but after three years entered the service of the state, serving F. C. Reed and Master Fish Warden Van Dusen. He then went back to the Government for a time, but was finally persuaded by Mr. Van Dusen to give his services to Oregon and has been with the state ever since. Superintendent Greenman is an exceptionally good man in his line. He, too, was formerly with the Government and for a time was employed by different South American republics. His present title under the State Board of Fish and Game Commissioners is "fish culturist-at-large."

Slapping Matches Are Substitute For Paint.
American Girls Also Should Run to Make Themselves Lithe and Stylish, and Whistle to Make Their Voices Soft and Refined Says Doctor.

LOS ANGELES, Cal., April 20.—(Special.)—The American woman's complexion needs more life, her lungs more capacity, her feet too "podgy," her spinning and her feet too "podgy." These observations have been made by Dr. Ludwig von Ferro, formerly of the University of Copenhagen, and soon to head the physiology department of the University of Paris. Dr. von Ferro is in Los Angeles, and has discussed the standpoints of the expert physiologist. Moreover, he has told what to do about them. For the complexion, he advocates slapping matches, just as men have boxing matches. A few good slaps in the face and a woman's whole system will tingle. The effect upon her cheeks will soon become permanent. In a slapping contest women will be called upon to utilize almost every muscle in their bodies.

"Another important thing is running. Perhaps it has never occurred to American women, but after they reach the age of say 18 they seldom, if ever, indulge in running. Have you ever noticed a dog which has been confined so that it has had no opportunity of running? It stalks along with the most ungainly walk you ever saw. And so it is with women. In that certain combination of muscles, the never brought into play, they stalk instead of walking gracefully.

"Then, the American woman's ankles are altogether too weak and podgy. The ankle supports the whole body and should be strengthened at every opportunity. Notice an athletic girl how well she departs herself and with what ease she walks along. Every muscle has been equally developed, so that she can use one naturally at a moment's notice.

Whistling Develops Lungs.
"As far as whistling is concerned, it has of course been advocated for many years as a good method of developing the lungs. It is not as good as singing, but there are many who cannot sing or who have comparatively few opportunities to do so. For the woman, whistling many times during a day's work. The more she develops her lungs the greater control she has of her voice, and thus she can more readily speak softly. All of the operatic vocalists have low, sweet voices, and assuredly their lungs are good.

Exercises should be adapted to certain conditions, and these exercises are most admirably adapted to the American woman in almost every sphere."

Sleep-Walker Arouses Hotel.
Thomas O'Brian, of Vancouver, B. C., has one unfortunate habit. He walks in his sleep. Mrs. Thomas O'Brian, an equally fortunate habit. She sleeps lightly. Sometimes, however, she does not sleep lightly enough to hear her husband start on his somnambulistic promenade. And this was the case at a local hotel this week.

"Thomas!" The excited wife sprang up suddenly into wakefulness and found her husband gone. He had been walking in his sleep.

"Slipping into a kimono she rushed to the telephone and called for the night porter.

"Quick, quick, come up at once. My husband's gone."

"Gone?" queried the clerk, rubbing a pair of tired eyes. It was about 3 A. M.

"Yes; he's somewhere about the hotel, walking in his sleep."

"Of course; it's been a habit of his for years. Please send somebody up to look for him."

Up flew a couple of boys and the elevator man. Mrs. O'Brian joined them at the fourth floor and the hunt was on. Around corners like the wind, peering under doors, under and over everything, after the sleep-walker they went. Not a soul on the fourth floor, and they hurried down to the third.

There, standing in the most careless negligence before the elevator

was O'Brian, gazing with glassy eyes at the bell.

"Deen, Deen, Deen, Allah, Allah," he was muttering, when the wife cried, "Thomas!" Just like that, Thomas awoke with a kind of shivering start and blinked his eyes. "Well what d'ye know about that?" he said, as they escorted him back to a still half-warm bed.

Pasadena Refuses Annexation.
Giving five reasons why Pasadena is unalterably opposed to becoming a part of Los Angeles, the Pasadena board of water commissioners has sent a communication to the public service commission of Los Angeles asking upon what other terms than annexation Pasadena can buy Owens River water when the aqueduct is completed.

As the first reason against annexation it is stated that Pasadena desires to retain control of its temperance laws, and it is added that this is in itself sufficient without the other four. The other reasons enumerated are:

"The people of Pasadena as a rule cannot be expected to know the political conditions and prospects of Los Angeles. A study of these conditions and disadvantages of annexation, would require much time. Although the official family of Los Angeles to the annexation of the city is growing so fast that the best kind of legislative and administrative work cannot be expected. Therefore, adding to the already existing municipal government the territory annexed, but it might also delay the political development of Los Angeles, and that would probably mean a delay in all other municipal development. Our local street department, it is believed, can meet our local needs in highways better than could the city of Los Angeles. Pasadena has her electric light plant that should, for the good of the public, be undertaken that might place the cause of the lighting plant in jeopardy. This plant has thus far been a successful protest against that type of corruption dishonesty and arrangement now in a measure disappearing. In passing it might be said that Los Angeles should assist us by selling current, at the lowest reasonable price, thus preventing with that of its enemy, which produces current from water power."

"A political body of moderate size can institute certain advanced political steps that could only be undertaken by a city the size of Los Angeles with much greater difficulty; at least, until the feasibility of a method thereof had been demonstrated in a smaller city. Some of the people of Pasadena believe she will take several steps within the next few years."

Twenty stock cars of bees are soon to be loaded and shipped from Southern California to Utah. The experiment of bringing bees from Utah to this state to winter was inaugurated four years ago, and the experiment proved so successful that now a good number of Utah apiarists bring their bees here for the winter months. They keep on storing up honey from orange blossoms and sagebrush blossoms during the winter season and when Spring arrives they are taken back to Utah to commence a like harvest on white sage and alfalfa.

It is claimed that the swarming of the bees in the winter season results in the bees multiplying rapidly here. When left to winter in Utah, on the contrary, the bees come out in the Spring in a stupor condition from which it takes several weeks for them to fully recover. The hives are closed tightly in the stock cars and not one is allowed to escape on the trip going and coming.

Contest Based on Mistake.
Because she made a mistake and improved the wrong piece of land, supposing it was her own, Katherine E. Baker, of El Centro, is fighting a contest preferred by B. H. Lien, of Imperial Valley, before the local land office. Mrs. Baker died a desert entry in August, 1910, and during the first year she spent \$224 for clearing the neighbor's land and running the borders and levels for irrigation. All this time she thought she was on her own land. Now she finds that she was confused in the location of the stakes, and while she has filed property, all her money and effort went on the quarter section next to her own. This land did not belong to Lien, but he discovered that Mrs. Baker had not improved her own land and saw an opening for a contest.

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