Federal Fish Farming

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IT WAS nearly 40 years ago that the United States government first awoke to the necessity of conserving the aquatic resources of the country, and began those operations in behalf of fishes, fishermen and fish-eaters that have now attained such gigantic proportions.

Several of the states had already established their local fish commissions or boards when in 1871 congress took the initial step toward a national fishery service by the passage of a joint resolution creating the office of commissioner of fish and fisheries.

The early years of the bureau of fisheries were devoted to an investigation of the condition of the fisheries of the Atlantic coast, Great Lakes, and other sections; to studies of the interior and coastal waters and their inhabitants, and to exploration of the off-shore fishing banks. The cultivation of useful fishes was soon taken up throughout the country and quickly attained large proportions. The natural expansion of the work was materially augmented from time to time by acts of congress, and in a comparatively short time the operations came to have a very wide scope.

From year to year, as the importance of the work has become increasingly evident, additional hatcheries have been built, the capacity of existing hatcheries has been enlarged, the scale of the operations has been extended, and new kinds of fishes have been added to the output.

Today there is scarcely a phase of aquiculture, of the fishing industry, or of biological and physical science as connected with the waters, that does not come within the purview of the bureau.

It is conceived to be the better policy to expend a small amount of public money in making fish so abundant that they can be caught without restriction and serve as cheap food for the people at large, rather than to expend a much larger sum in preventing people from catching the few fish that still remain after generations of improvidence.

Public or government fish-culture in America exceeds in extent and importance that of all other countries combined. However, the neglect of some of the states to provide the minimum protection to certain species inhabiting interstate and international waters has not only negatived the fish-cultural work of the bureau and of the states themselves, but has practically inhibited it by preventing the possibility of securing an adequate supply of eggs, thus making desirable and necessary the placing of interstate and international waters under the jurisdiction of the general government.

At the end of the first ten years of the bureau's existence, the fishes that were being regularly cultivated were shad, carp, chinook salmon, Atlantic salmon, land-locked salmon, rainbow trout, brook trout and whitefish, in addition to which the propagation of several others had been undertaken experimentally. The list now is six times as long and the annual output is ten times the aggregate for the ten-year period ending in 1881.

The main energies are devoted to the important commercial fishes—shad, whitefish, lake trout, Pacific salmons, white perch, yellow perch, cod, flatfish and the lobster, which are hatched in lots of many millions annually. More widely popular, however, are the distributions of the fishes of the interior waters which are generally classed as game fishes. Although representing only about 10 per cent. of the output of the hatcheries, this feature of the work is very important, for it supplies choice kinds of fish for public rivers, lakes and ponds, and for fishing preserves and private ponds and streams in all parts of the United States. The fishes most in demand for these purposes are the land-locked salmon, the different species of trout, the grayling, the basses, the crappies, the sunfishes, and the catfishes, but various others also are handled.

Fish-cultural stations are established by special act of congress, and their location and construction are determined after a careful survey of the available sites in a given state. The usual buildings are the hatchery proper, a residence for the superintendent and his family, and necessary outbuildings. At some stations there may also be power house, foreman's or fish-culturist's dwelling, mess hall and stable.

The only permanent marine hatcheries are in Maine and Massachusetts, where the cod, pollock, flatfish, and lobsters are hatched in immense numbers. Other sea fishes that have in previous years been artificially propagated and may again come under the hand of the fish-culturist are the haddock, the scuppaug, the sheepshead, the sea bass, the mackerel, and the squeteague, some of which were hatched on the steamer Fish Hawk, in Chesapeake bay and Florida.

The fish-cultural work on the eastern coast streams was centered at six hatcheries and subhatcheries in 1909. At one of these the principal species handled is the Atlantic salmon, at four the shad, at three the yellow perch, at two the white perch, and at one the striped bass. In recent years the bureau has operated a shad hatchery on the Delaware river, and has detailed the steamer Fish Hawk for shad hatching in Maine, New Jersey, North Carolina and Florida. The central station, in Washington, is operated largely for experimental and exhibition purposes.

In order to counteract the effects of the very exhausting fisheries of the Great Lakes, the government has maintained hatcheries for many years, and now operates six belonging to the United States and two belonging to the state of Michigan. The fishes to which attention is given are those which enter most largely into the catch of the fishermen, namely, the whitefish, cisco, lake trout, and pike perch, the annual output of which now exceeds one and a half billions. Under arrangement with the Canadian authorities, two egg-collection stations for whitefish, cisco, and lake trout are maintained at points in Ontario.

While surveying a new "bank" on the coast of Alaska, the government steamer Albatross in 20 minutes made the experimental catch of cod and halibut shown in one of our illustrations. As a result of explorations of the Albatross on the Pacific coast, fisheries of great importance have been established there.

The hatcheries on the rivers and lakes of the Pacific coast are devoted almost exclusively to the various salmons. In California, where the bureau established a salmon hatchery as early as 1872, there is one central or main station, at Baird, on the McCloud river, with important collecting stations on two other tributaries of the Sacramento. In Oregon a central hatchery at Oregon City, on the Willamette river, has three subhatcheries on tributaries of the Columbia, in Oregon and Washington, and three subhatcheries on tributaries of the Rogue river, Oregon, in addition to several egg-collecting station.

The interests of the large salmon fisheries of the Puget Sound region are safeguarded by a hatchery on Baker lake, on the Skagit river.

A significant feature of artificial propagation on the Pacific seaboard is that in the Columbia basin the hatching of the acclimatized shad has begun on a small scale, and in the Sacramento basin the cultivation of the acclimatized striped bass has commenced under conditions which indicate that more eggs of this species may be obtained in California than in any of the states to which the fish is native.

The hatcheries in the interior regions constitute the most numerous class, and their output reaches the largest number of people. Their operations are addressed chiefly to the so-called "game" fishes, which, while caught mostly by anglers, nevertheless constitute an important element of the food supply. At these stations large numbers of fish are reared to the fingerling or yearling sizes before being released; for this purpose more or less extensive pond areas are required.

The fish-cultural work of the federal government has now attained a magnitude that cannot readily be comprehended, and is increasing at an exceedingly rapid rate. Especially marked has been the increase in the hatchery product during the past ten years, owing in part to the extension of operations at existing stations, and in part to greater efficiency of methods and appliances. The work during the fiscal year 1909 reached larger proportions than ever before, over three billion fish being produced and planted.

While the bureau does not lay undue stress on mere numbers and considers the vitality of the fish and the conditions under which they are planted as of paramount importance, the foregoing figures are certainly very suggestive and as a further statement of the magnitude of the fish-cultural work, it may be of interest to record that the aggregate output of the hatcheries from 1872 to 1909 was about 28 billion, of which over 13 billion represents the work of the past six years.

In making his original plans for the systematic investigation of the waters of the United States and the biological and physical problems they present, Commissioner Baird insisted that to study only the food-fishes would be of little importance, and that useful conclusions must needs rest upon a broad foundation of investigations purely scientific in character. The life history of species of economic value should be understood from beginning to end, but no less requisite is it to know the histories of the animals and plants upon which they feed or upon which their fed is nourished; the history of their enemies and friends and the friends and foes of their enemies and friends, as well as the currents, temperatures, and other physical phenomena of the waters in relation to migration, reproduction and growth.

In pursuance of this policy the bureau has secured the services of many prominent men of science, and much of the progress in the artificial propagation of fishes, in the investigation of fishery problems, and in the extension of knowledge of our aquatic resources has been due men eminent as zoologists who have been associated with the work temporarily. Their services have been the services of specialists for particular problems, and through them the bureau has not only been able to give to the public the practical results of applied science, but has contributed to pure science valuable knowledge of all forms of aquatic life.

The importance to the fishing interests of the work of the bureau in connection with the economic fisheries is widely appreciated and freely acknowledged. The statistical inquiries of the bureau afford the only adequate basis for determining the condition and trend of the fisheries and the results of legislation, protection, and cultivation. Among the numerous special matters in which the bureau has benefited the fisheries the following may be mentioned:

By bringing to the attention of American fishermen new methods and new apparatus, new fisheries have sometimes been established and new fields exploited.

By the introduction of cod gill nets the winter cod fishery of New England was revolutionized. In a single season shortly after the use of such nets began a few Cape Ann (Gloucester) fishermen took by this means over 8,000,000 pounds of large-sized fish, and as much as $50,000 has sometimes been saved annually in the single item of bait.

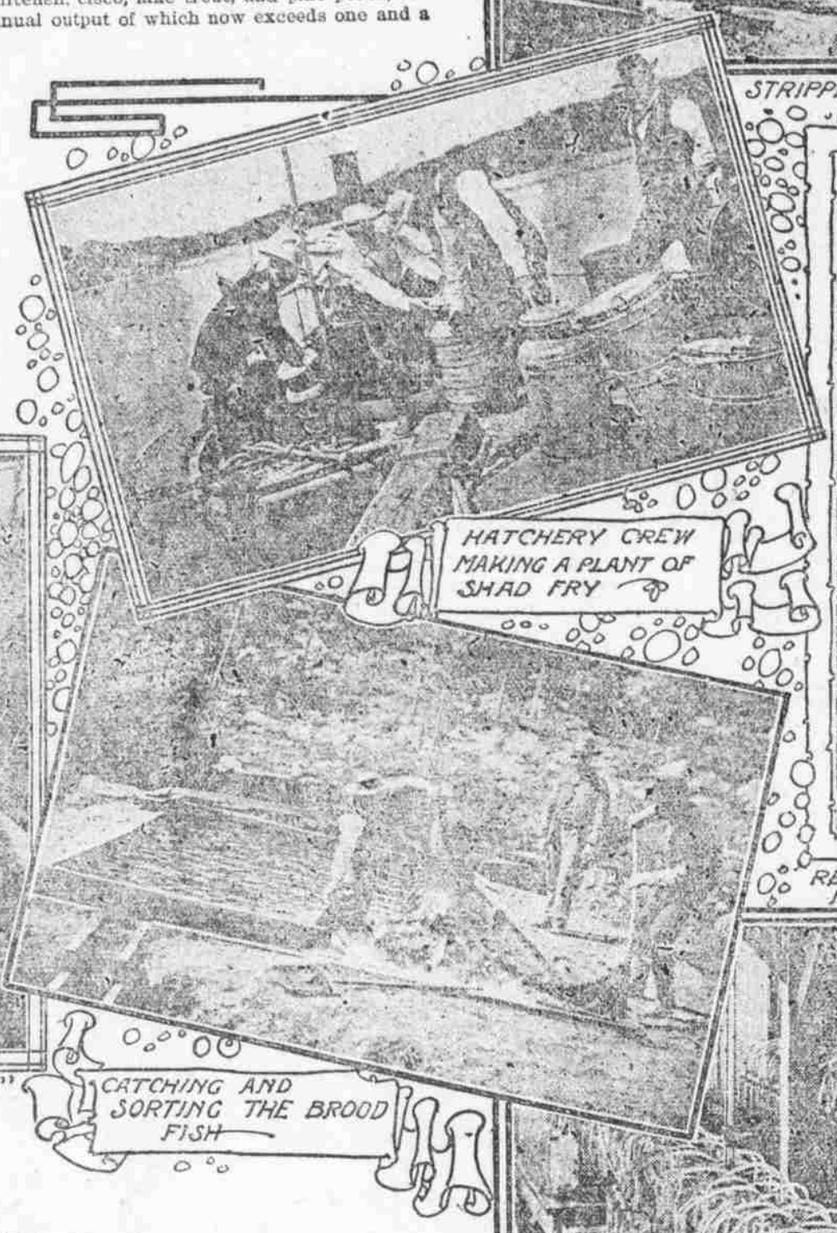
By the dissemination of information regarding new fishing grounds important fisheries have been inaugurated. Thus when the abundance of halibut off the coast of Iceland was made known by the bureau, a fishery was begun which yielded from $70,000 to $100,000 annually to the New England fishermen.

Owing to the appalling mortality among the crews of the New England fishing vessels, caused in large part by the foundering of vessels at sea, the bureau many years ago undertook the introduction into the offshore fisheries of a type of craft which would combine large carrying capacity and great sped with enhanced safety. By correspondence, discussion in the daily press, personal interviews, exhibition of models and finally by the actual construction of a full-sized schooner (the Grampus), with the requisite qualities, the bureau was enabled to inaugurate a momentous change in the architecture of fishing vessels; so that for a long time the New England schooners have been constructed on the new lines, with a consequent minimizing of disasters and a decided increase in efficiency.

In other fisheries and regions the bureau has likewise advocated improved types of vessels and boats especially adapted to local conditions, and has published plans and specifications embodying the results of studies of the fishing flotilla of the world.

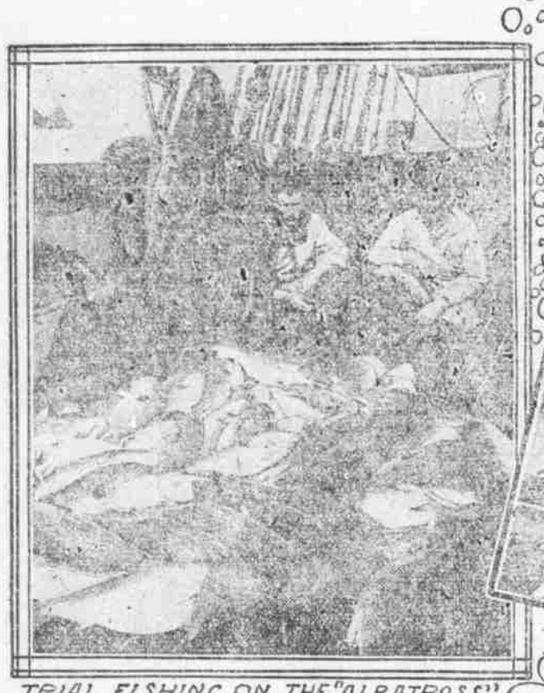
The results of the bureau's efforts in this line in saving life and property, in increasing the usefulness of the vessels, and in improving the quality of the catch as landed, cannot be estimated, but the beneficial effects may be partly appreciated when it is stated that during the ten years ending in 1883, when the old types of vessels were in use, there were lost by foundering from the port of Gloucester alone, 82 vessels, valued at more than $400,000, with their crews of 895 men, while during the ten years ending in 1907, the losses from this cause aggregated only a fourth as many vessels and men

INTERIOR OF A SHAD HATCHERY



STRIPPING TROUT OF THEIR EGGS

REMOVING SHAD EGGS AT A STATION IN NORTH CAROLINA



TRIAL FISHING ON THE "ALBATROSS"

HATCHERY CREW MAKING A PLANT OF SHAD FRY

CATCHING AND SORTING THE BROOD FISH

STUNG BY BASE INGRATITUDE

Bowery Denizen Seemingly Had Right to Be Indignant at Old Friend's Attitude.

"You remember dat guy, Jim Burke?" asked an irate Bowery denizen. "He's dat stiff dat's doin' time up der river—Sing Sing—boiglary—ten years. Well, you know all I done fer dat stiff. When he was pinched didn't I put up der coin for der lawyers? Didn't I pay der witnesses? Sure I did. De oder day I t'inks I'll just go an' see dat mutt just t' leave him know his frien's ain't tied de can on 'im. So I drives out to d' jail and goes into d' warden's office and he says I gotter send me card in. Me card! D'ye get dat? Well, anyway, I writes my name on a piece o' paper an' a guy takes it into Jim Burke, an' what d' you t'ink dat stiff tells dat guy to tell me?"

"I've no idea," said the listener.

"He tells him," concluded the angry one, "t' tell me dat he ain't in!"—From Success Magazine.

How Lightning Splits Trees.

Lightning makes trees explode, like overcharged boilers. The flame of the lightning does not burn them up, nor does the electric flash split them like an ax. The bolt flows through into all the damp interstices of the trunk and into the hollows under its bark. All the moisture at once is turned into steam, which by its immediate explosion rips open the tree. For centuries this simple theory puzzled scientists, but they have got it right at last.

Not to Overdo It.

Lily—I'se gwine to a s'prise party tonight, Miss Sally.

Miss Sally—What will you take for a present?

Lily—Well, we didn' cal'late on takin' no present. Yo' see, we don't wan' to s'prise 'em too much.

Evidences of Wealth.

"I wish we had a piano; I'd like to impress those people."

"Show 'em the piece of beef you've got in the refrigerator."

Get a Move On.

The Loafer—Alas! my ship doesn't come in.

The Real Man—Then get a move on and help some other fellow unload his.

By associating with some old people you may realize the truth of the saying, "The good die young."

The discovery that he has invested in a salted mine is apt to make a man peppery.

A man knows but little if he tells you tell me if my wife is here?