

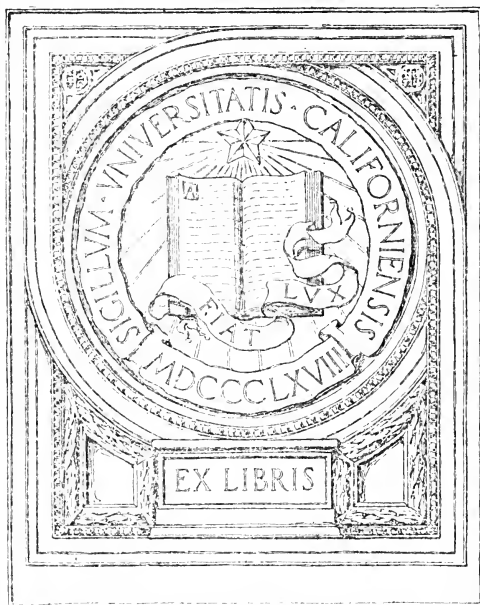
SK
361
A5
192

UC-NRLF



5B 33 691

GIFT OF

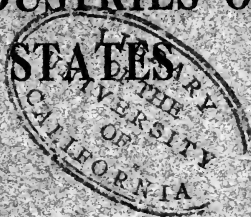


EX LIBRIS

U.S. State Dept. DEC 22 1922

DEPARTMENT OF COMMERCE

THE FISHERY INDUSTRIES OF
THE UNITED STATES



REPORT PREPARED FOR
THE COMMISSION OF THE UNITED STATES OF AMERICA
TO THE BRAZIL CENTENNIAL EXPOSITION



For Distribution at the Brazil Centennial Exposition
1922-1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1922

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation



U. S. BUREAU OF FISHERIES, WASHINGTON, D. C.



DEPARTMENT OF COMMERCE

**THE FISHERY INDUSTRIES OF THE
UNITED STATES**



**Supplementing Exhibit
of the
UNITED STATES BUREAU OF FISHERIES
at the
BRAZIL CENTENNIAL EXPOSITION
Rio de Janeiro, Brazil
1922-1923**



By

LEWIS RADCLIFFE

**Assistant in Charge, Division of Fishery Industries
United States Bureau of Fisheries**

70 VMD
ABROUJAO

SK361

A5

1922

Gift

THE FISHERY INDUSTRIES OF THE UNITED STATES.

Our sister Republic, the United States of Brazil, has an abundant supply of edible fish in her coastal and interior waters and realizes the importance of more fully developing this important food resource for the use of her people. Brazilians may therefore be interested in a brief review of the character and importance of the fisheries of the United States of America as a source of food and products valued in the arts and industries, and in the relationship of the United States Bureau of Fisheries to this industry. Her students may be interested in the educational opportunities afforded by our fishery colleges and her business men in the possibilities of obtaining supplies, from fish nets to fishery products, readily procurable in the United States of America.

At the very beginning of our history the fisheries were of the greatest importance, some of the early settlements, at times, being wholly dependent for continued existence upon fish as the only available food supply. The fisheries have continued to hold high rank in our industrial growth, as an important source of food and for the training of seamen for war or peace time pursuits. At present there are about 200,000 persons actively engaged in the fisheries of the United States and Alaska, using approximately 6,500 vessels of 5 tons net or over, and 75,000 small boats for the capture and transporting of fishery products, employing nets and other fishing apparatus with a value aggregating \$15,000,000. The capital invested approximates \$170,000,000, and the annual yield of fishery products amounts to approximately 2,500,000,000 pounds, with a value of \$85,000,000 to the fishermen, and a much greater value as prepared for the market. Of the total catch, about 68 per cent consists of marine products, 20 per cent of anadromous species, and 12 per cent of fresh-water forms. The Atlantic seaboard supplies about 64 per cent of the catch, the Pacific coast States, Alaska, and the interior United States waters about 12 per cent each.

FISHING GROUNDS.

The most important fishing areas are the relatively shoal water banks lying off the eastern coast of North America from Newfoundland to Massachusetts. These banks are about 70,000 square miles in area, and

support highly important fisheries for cod, haddock, halibut, pollock, hake and other fishes. Similarly, on the west coast, there are important fishing banks from Oregon to Alaska inclusive, which maintain important fisheries for halibut, cod, sablefish, and other species. On the remaining coastal area, fishing banks are of lesser importance. There are, however, important coastal and river fisheries for shellfish, oysters, clams, lobster, crabs, etc.; surface schooling fishes (mackerel, tunas, and menhaden); anadromous species (salmon, shad, and river herring), and the like. Of the interior waters, the Great Lakes on the northern boundary line are most important, maintaining valuable fisheries for whitefish, ciscoes, pike perches, and carp. Approximately one-third of the catch of interior waters is taken from these lakes, amounting to about 100,000,000 pounds annually.

FISHING APPARATUS.

Pound nets, traps, and weirs are the most important form of fishing gear, representing 45 per cent of the total investment in fishing apparatus in the United States. These are fixed nets, set as a rule in relatively shallow water (up to 50 feet), and are employed in the capture of marine, anadromous, and fresh-water fishes. The distinctive feature of such gear, is a long leader of webbing or brush which serves to deflect the fishes swimming along the shore or ascending the streams into a pocket or trap.

Gill nets represent 28 per cent of the investment in fishing apparatus. These may be stationary or drifted with the tide, the fish becoming entangled in the fine webbed meshes. Seines rank third in value, representing 12 per cent of the investment, and are used to surround the fish by encircling (purse seine) or by bringing the free ends to the shore (haul seine). Lobster pots represent about 4 per cent and lines about 3 per cent of the investment. Many other forms of apparatus, such as trammel nets, fyke nets, stop nets, beam trawls, otter trawls, dredges, drags, tongs, rakes, grapples, etc., are employed in the fisheries of the United States.

FISHERIES.

Salmon.—The Pacific salmon fishery may be classed as the most important commercial fishery in the United States, the annual catch exceeding 300,000,000 pounds. The five important species are as follows:

King or chinook salmon, flesh deep salmon red or white.

Blueback, sockeye, or red salmon, flesh red, forms the greatest part of the canned salmon of the world.

Silver or coho salmon, flesh of excellent flavor, but paler in color than the red salmon.

Pink or humpback salmon, flesh pale, hence canned as "pink" salmon.

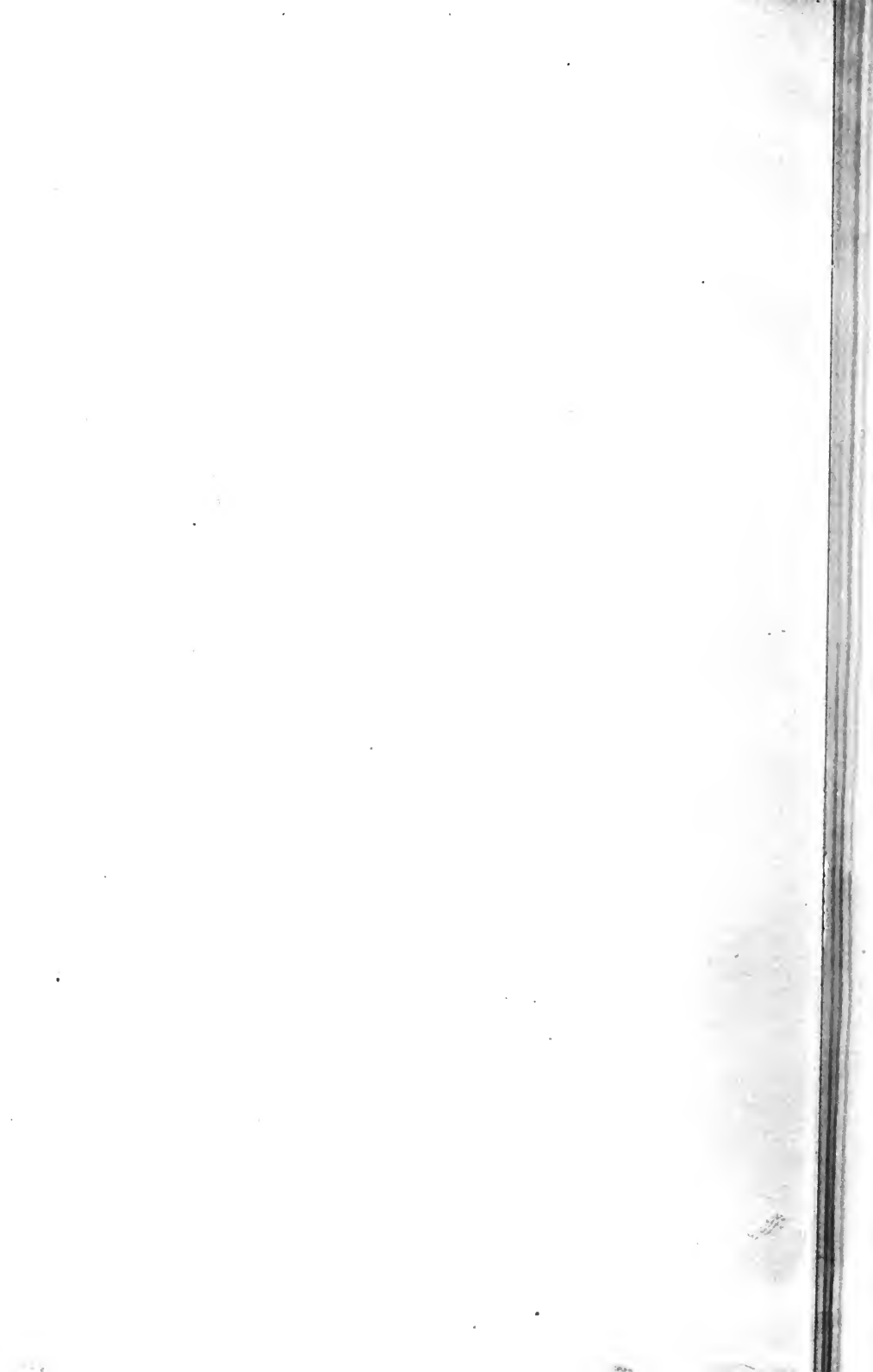
Chum salmon, flesh light yellow.



DIPPING SALMON, COPPER RIVER, ALASKA (PRIMITIVE METHOD).



CATCH OF 36,000 SALMON IN TRAP (MODERN METHOD).



These fish are marketed fresh, frozen, canned, mild-cured, pickled, dry-salted, and smoked. The chief method of preservation is by canning. The annual pack valued at \$30,000,000 or more is in part exported to all parts of the world. This fishery also yields annually in excess of 1,500 tons of fish scrap and meal, and 70,000 gallons of salmon oil.

Oysters.—The oyster industry ranks next to the salmon fishery in importance, although there has been a large decline in recent years. The present annual yield amounts to about 150,000,000 pounds, with a value of nearly \$15,000,000 to the fishermen. This fishery is of particular importance along the Atlantic coast from Rhode Island to Louisiana. Oysters are marketed fresh and canned. The annual pack of canned oysters exceeds \$2,000,000 in value. The shells are ground and used as grit for poultry or lime for the soil to counteract acidity. The 1921 production of these commodities exceeded 259,000 tons.

Herring.—The principal fisheries for members of the herring family are in Maine, California, and Alaska. In Maine the sea herring is fished for intensively—chiefly for canning as sardines—the annual catch exceeding 100,000,000 pounds. The value of the annual pack of sardines has varied in recent years from about \$4,000,000 to \$12,000,000. In California the pilchard is abundant and is extensively used for canning as sardines, the value of the annual pack varying from \$2,250,000 to \$3,750,000. In Alaska the Alaska herring is chiefly preserved by salting, including preservation by the Scotch-cure. These fisheries also yield considerable quantities of fish fertilizer, meal, and oil.

Cod.—The principal fisheries for cod lie off the New England and Canadian coasts, chiefly on the fishing banks. Several million pounds of cod are also caught on the banks off the coast of Alaska each year, but this fishery is capable of much greater development. The annual catch of cod exceeds 100,000,000 pounds and is marketed chiefly in the fresh state or salted and dried.

Haddock.—The annual catch of haddock, landed almost entirely at New England fishing ports, amounts to about 90,000,000 pounds, most of which is marketed fresh, salted, and dried or smoked.

Halibut.—Formerly there was an important fishery for halibut on the fishing grounds off the New England and Canadian coasts. With the partial depletion of this fishery, operations were largely transferred to the west coast, chiefly to the banks off Alaska, and in recent years the bulk of the supply has been obtained from this region. The annual catch of both coasts is about 60,000,000 pounds, the bulk of which is marketed fresh or frozen.

Menhaden.—This fish, occurring along the entire Atlantic coast, is used almost wholly for the production of fish scrap for fertilizer purposes, fish meal for feeding hogs, cattle, and poultry, and fish oil used in the manufacture of soap, paints, and various other articles. The catch of this

fish exceeds that of any other species taken in United States waters, amounting to as much as 900,000,000 pounds annually.

Other important fisheries are those for ciscoes or lake herring in the Great Lakes region, annual yield exceeding 50,000,000 pounds; alewives, or river herring, along the Atlantic seaboard, yield about 45,000,000 pounds; squeteagues, occurring along the Atlantic seaboard, annual catch in excess of 40,000,000 pounds; shrimp, taken in the South Atlantic and Gulf States, California, and Alaska, yield approximately 44,000,000 pounds; mullet, taken chiefly in the South Atlantic and Gulf States, yield in excess of 40,000,000 pounds; crabs, taken principally in the Middle Atlantic States section, yield exceeding 30,000,000 pounds; and shad, native to the Atlantic coast and transplanted to the Pacific coast, yield about 27,000,000 pounds.

METHODS OF PRESERVATION.

The perishable character of fish, the difficulties in marketing them alive, the remoteness of production from points of consumption, and the seasonal character of the catch are factors which have contributed to the development of excellent methods of preservation by drying, salting, smoking, canning, and refrigeration, and endless variations to these fundamental methods. The ability effectively to preserve the catch has been of the greatest importance in the upbuilding of the fishing industry in the United States.

FRESH FISH.

The long distances between points of production and consumption in the United States require that fresh fish receive some measure of preservation. This is provided for by packing the fish in wooden containers (boxes or barrels of various sizes) packed in alternate layers of ice. In addition, use is made of refrigeration cars. In this way large quantities of fresh fish are shipped thousands of miles from points of capture.

DRYING.

Drying in the open air, the oldest form of fish curing, is but little used in the United States, climatic conditions generally being unfavorable to this method of preservation. Increasing interest is being shown in the possibilities of preparing dehydrated or desiccated products by machinery. These, however, have not reached the point of large commercial production.

SALTING FISH.

The practice of preserving fish by means of salt is also of great antiquity and represents one of the simplest and cheapest methods in use. The basic methods of application are two—packing the fish in dry salt, and in salt brine (pickle). The so-called dried cod, hake, haddock, pollock, cusk, and the like, which enter so largely into trade, domestic and foreign,

are in reality dry salted products which are afterwards dried in the open air on flakes or in specially constructed driers. Such products are especially well adapted for marketing under adverse climatic conditions and therefore widely distributed in the world's markets.

Preservation in salt brine is commonly employed with such fishes as mackerel, herring, salmon, ciscoes, and mullet. This is also an effective means of preserving fish temporarily which are to be used for smoking and the like. The degree of preservation sought for and the variations in processes are numerous. In the case of Scotch-cured herring the fish are allowed to cure in their own blood pickle which imparts to the product a distinct flavor. In the mild curing of such fish as salmon, caught in temperate climates, preservation is only partially effected by the relatively weak brine, the fish being held in cold storage. Neither of these processes are well adapted to warm climates.

SMOKING.

Smoked fishery products may be classed among the most delectable of foods, but because of the fact that the product will not keep for long periods in the open, the industry is quite localized in character. For smoking, oily fish, such as herring, salmon, ciscoes, sturgeon, and whitefish, are preferred. Of the less oily fish used for smoking, the haddock is the most important. To supply the smoke flavor with permanent preservation, large quantities of fish are now preserved by canning after being lightly smoked.

CANNING.

This important means of preservation is extensively employed in the United States, particularly for salmon, sardines, tunas, shrimp, oysters, clams, and crabs. In 1921, the value of canned products produced exceeded \$46,000,000.

REFRIGERATION.

Freezing is important as conserving fish in times of abundance and cheapness for use in a fresh state in times of scarcity. This method of preservation is employed on a large scale in the United States, from about 80,000,000 to 90,000,000 pounds being frozen per annum. In the past it has been customary to freeze fishery products in air. At the present time much interest is revealed in the possibilities of freezing in brine.

BY-PRODUCTS AND MISCELLANEOUS PRODUCTS.

In the United States extensive use is made of unmarketable fish and the waste in preparing fishery products for market. These yield large quantities of fish scrap which is used as an ingredient for fertilizers; fish meal used as a stock feed; fish oil used for making soap and paints, for currying leather, and for medicinal and lubricating purposes; fish glue; etc. The hides of sharks and other aquatic animals are used for tanning into ex-

cellent leathers; the scales of certain fishes are employed in the preparation of pearl essence for the manufacture of artificial pearls; oyster shells are ground and used for poultry feeds, liming soil, road-building, etc.; the fresh-water pearl mussel shells are the basis of the highly important pearl button industry; shark fins are dried for the oriental trade; and various other resources of the fisheries are employed for use in the arts and industries. The value of the by-products in 1921 exceeded \$8,000,000, and of miscellaneous products was approximately equal.

U. S. BUREAU OF FISHERIES.

The United States Congress passed a joint resolution approved February 9, 1871, providing for the appointment of a Commissioner of Fish and Fisheries, who was directed to conduct investigations concerning the facts and the causes of the alleged diminution in value and importance of the fisheries and the feasibility of remedial measures. This represents the beginning of one of the earliest and most effective conservation movements undertaken by the Federal Government. Prior to July 1, 1903, the establishment was independent, reporting directly to Congress, and was known as the United States Commission of Fish and Fisheries, but, on the organization of the Department of Commerce, it was included by law in the new department and the name was changed to its present designation, the United States Bureau of Fisheries.

The original conception of the bureau was a body for scientific, statistical, and practical investigation of the fisheries, and these phases of its work always have been prominent. By an act approved June 10, 1872, authority was given for the propagation of food fishes, a branch of the service which has grown until it constitutes a large part of the bureau's activities. Without administrative or executive control, except in the administration of the laws regarding Alaska fish and certain fur-bearing animals, and the sponge fisheries on the high seas off the coast of Florida, the bureau, acting in an advisory capacity has been able to exert a powerful influence on the fisheries legislation of the States.

There is in charge of the bureau's work the Commissioner of Fish and Fisheries and the deputy commissioner, the work of the bureau being organized into divisions, each with an assistant in charge, as follows:

Division of Administration.—This division exercises supervision of the accounting office, office of the architect and engineer, the vessels of the bureau, the library, records, correspondence, and property. It is responsible for the purchase, maintenance, and repair of all vessels and boats, and for accounting relative to appropriations and property.

Division of Fishery Industries.—The important functions of this division in its relations with the commercial fisheries include the following:

- (1) Studies of the methods of conducting fishing operations for the purpose of effecting improvements and revealing the use of destructive or unprofitable methods;

- (2) Development of improvements in the methods of handling, distribution and marketing of fishery products;
- (3) The conduct of technological investigations of the underlying scientific principles governing the preservation of fishery products in order to standardize methods and effect improvements and economy of operation; to develop new methods, to discourage the use of unsatisfactory, wasteful or uneconomical practices; to improve methods of preserving gear and the like;
- (4) To introduce useful foreign methods or processes of capture, preservation, and utilization of fishery products;
- (5) To collect statistics of the fisheries and fishery industries;
- (6) To increase the use of the by-products of the fisheries and the unutilized products of the sea;
- (7) To increase the demand for the little-used or neglected fishes and fishery products for food;
- (8) To study and develop fishing grounds and fisheries for hitherto unutilized fishes.

This division has in Washington, D. C., an excellently equipped fishery products laboratory for the conduct of its technological investigations.

Division of Fish Culture.—This division has charge of all operations connected with the artificial propagation, distribution, and rescue of fishes. Its practical work in 1921 was conducted through 35 fish-cultural stations and 65 field or substations, and 5 distribution railway cars, with an aggregate output of approximately 5,000,000,000 fish and eggs. Approximately 93 per cent of this output consisted, as heretofore, of the salmon, shad, whitefish, pike perches, yellow perch, lake trout, cod, pollock, and winter flounder, which constitute the more important commercial species.

Division of Inquiry Respecting Food Fishes.—This division deals with the biological, biochemical, and conservational problems of the fisheries needful for the judicious exploitation and the means and conditions of maintenance or possible increase of supplies.

These investigations and experiments are conducted in the laboratory in Washington, D. C., at two marine biological stations on the Atlantic coast, one on the Gulf coast, and one fresh-water station in the Mississippi Valley, and through field parties. There are also one especially equipped steamer for deep-sea investigations, one for coastal work, and a number of smaller craft for inshore and river duty. An important feature of the work is furnishing advice and facts relative to fisheries legislation and administration. This division also conducts investigations and experiments tending directly to the increase of economic aquatic animals, such as sponges, oysters, mussels, and terrapin.

Alaska Fisheries and Fur-Seal Service.—This service, which is under the immediate charge of the Commissioner of Fisheries, consists of two

important subdivisions, namely, the fur-seal service and the salmon service. The fur-seal service has to do with all matters pertaining to the administration and maintenance of the fur-seal fishery of Alaska and to the control of the Pribilof Islands, including the taking and marketing of the sealskins, an important source of revenue to the Federal Government. The fisheries service is charged with the enforcement of the laws and the regulations relating to the salmon and other fisheries of Alaska, and with the inspection of fisheries, canneries, salteries, hatcheries, and other similar establishments.

The work of the bureau, particularly in the field of fish culture, is supplemented by the various State fish and game commissions.

FISHERY COLLEGES.

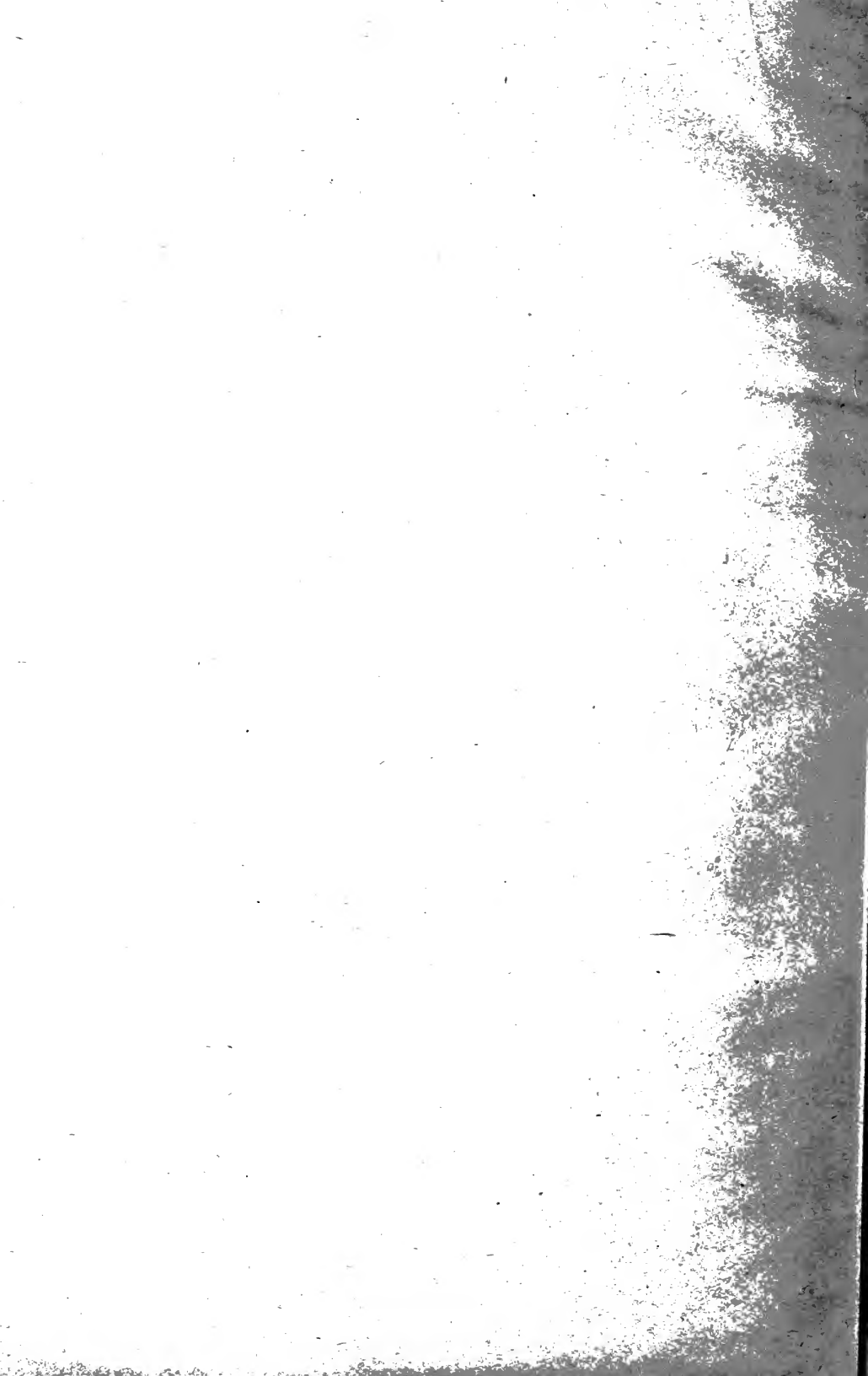
Provision is made at two universities in the United States, namely the University of Washington, Seattle, Wash., and Massachusetts Institute of Technology, Cambridge, Mass., for the training of students to enter the fisheries, including the commercial, fish-cultural, and biological fields. Cornell University, Ithaca, N. Y., provides a course in fish culture in connection with its college of agriculture.

AMERICAN MARKETS.

The foregoing pages have revealed something of the extent of the fishing industry of the United States. To maintain this industry the United States is amply supplied with manufacturers of cordage, twine, canning machinery and supplies, shipyards, cold-storage and ice equipment, sportsmen's supplies, and other requirements of the fisheries. In addition, the production of the fishery products is of sufficient magnitude to enable it to engage in a large fishery export trade.







UNIVERSITY OF CALIFORNIA LIBRARY
BERKELEY

Return to desk from which borrowed.
This book is DUE on the last date stamped below.

JAN 23 1948

MAY 20 1948
LIBRARY USE

JUL 20 1951

Due end of SPRING Quarter
subject to recall after —

MAY 20 71 11

REC'D LD MAY 10 71 -11AM 7 6

493814

SK367

A5

1922

UNIVERSITY OF CALIFORNIA LIBRARY

