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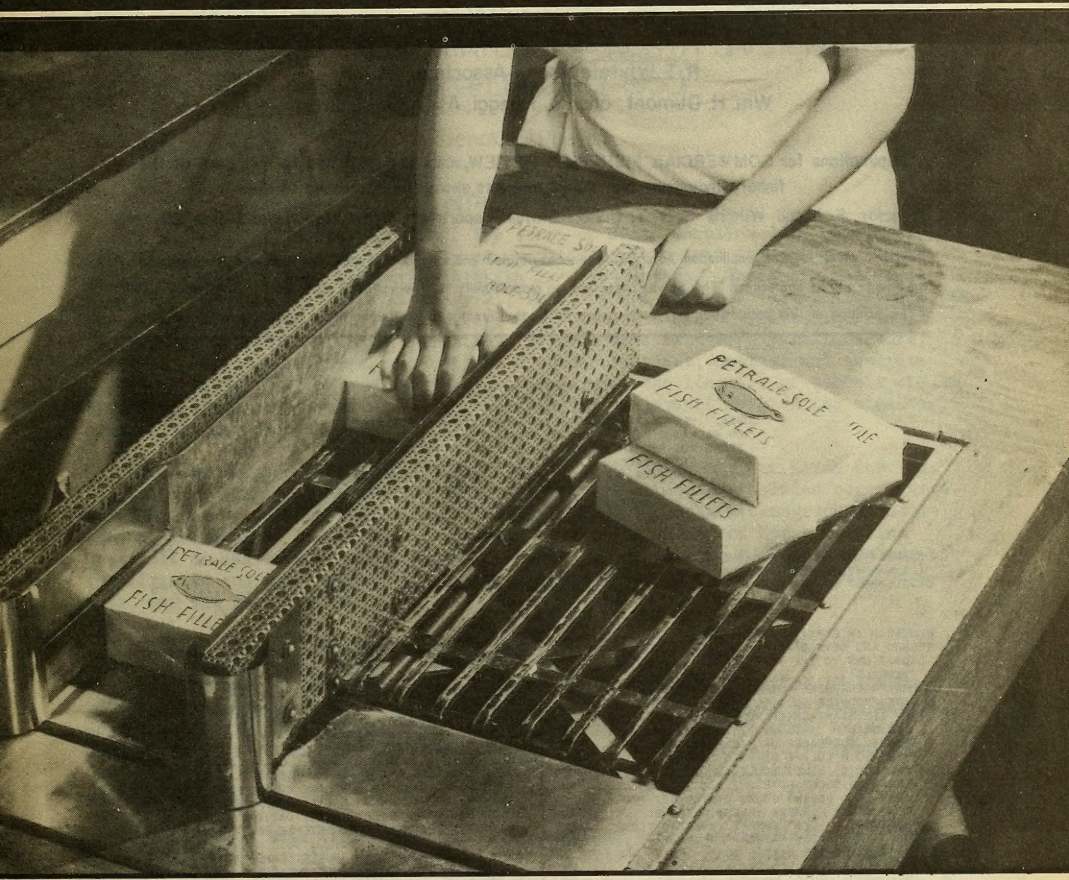
COMMERCIAL FISHERIES REVIEW



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COMMERCIAL FISHERIES REVIEW

A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES
PREPARED IN THE BRANCH OF COMMERCIAL FISHERIES

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COMMERCIAL FISHERIES REVIEW

July 1950 Washington 25, D.C. Vol.12, No.7

OBSERVATIONS ON THE COMMERCIAL FISHING POTENTIALITIES IN THE OFFSHORE WATERS OF NORTH CAROLINA (JANUARY-FEBRUARY 1950)

By Donald E. Powell*

INTRODUCTION

A series of fishing cruises off the coast of North Carolina were conducted to determine primarily the trawlability of unexplored bottom and to find the distribution and abundance of fish and shellfish in these waters. These cruises were conducted from January 16 to February 21, 1950, by the research vessel Albatross III of the U. S. Fish and Wildlife Service's North Atlantic Fishery Investigations.1/ In addition to actual fishing operations, records were kept of physical factors, such as, water temperatures, salinities, bottom conditions, depths, and accurate positions on all courses run. Attempts to determine the location of schools of fish with recording fathometers were made, and tagging of several species for migratory studies was carried out.

The work was done in close cooperation with the University of North Carolina Institute of Fisheries Research. Scientific personnel aboard included representatives of the U. S. Fish and Wildlife Service, the Woods Hole Oceanographic Institution, the Bingham Oceanographic Laboratory, the University of North Carolina Institute of Fishery Research, Rutgers and Duke Universities, and staff members of the Virginia and Maryland State fishery laboratories. Morehead City, North Carolina, was the base from which all cruises originated.

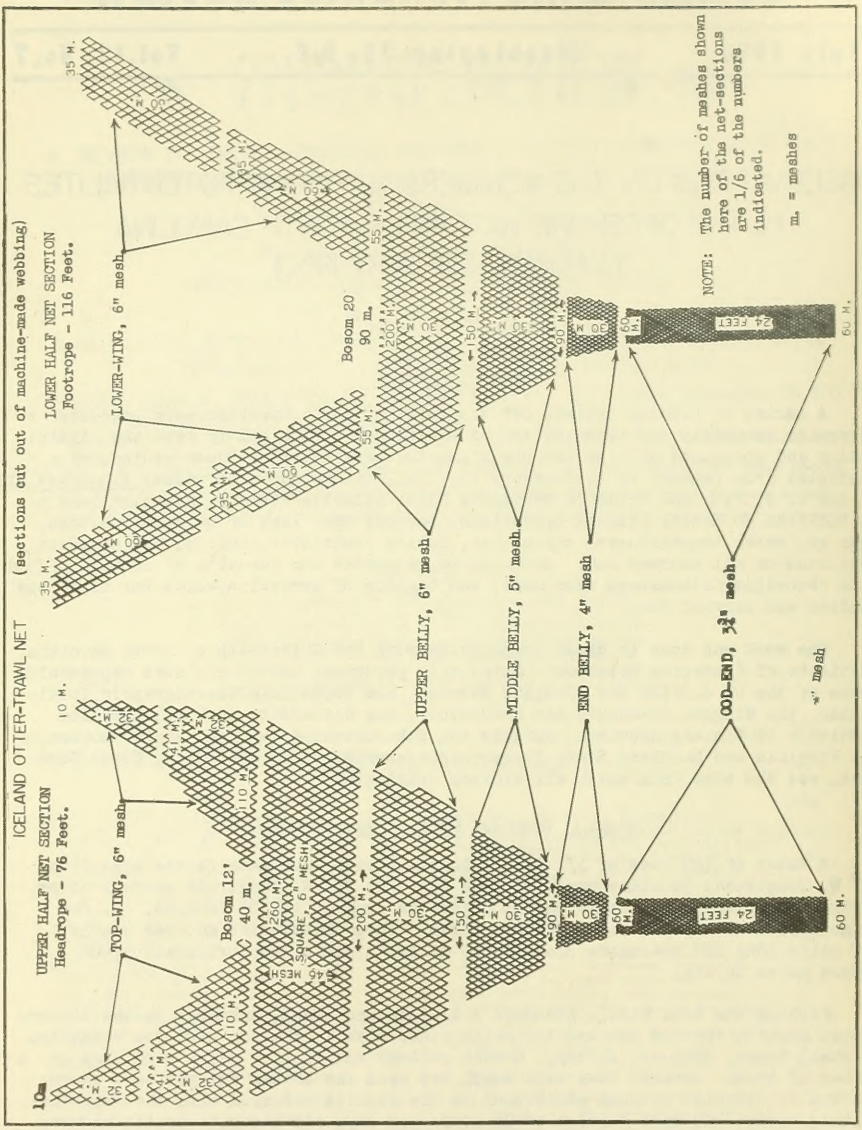
GENERAL OPERATIONS AND OBSERVATIONS

A total of 162 tows of 1/2- and 1-hour duration were made in the area from 78° W. longitude, 60 miles south of Cape Fear, to 75° W. longitude several miles northeast of Cape Hatteras in waters of depths from 10 to 100 fathoms. A few drags were made beyond the 100-fathom curve. This constitutes an area nearly 200 miles long and averaging close to 15 miles in width, approximately 3,000 square miles in all.

Fishing was done with a standard 1 1/2-Iceland trawl, side-set in the conventional manner, the cod end and top belly lined with 1 1/2-inch mesh for retention of small forms, such as, shrimp. Wooden rollers and tickler chain were used on a number of tows. Several tows with small try nets and bottom dredges were unproductive or revealed nothing additional to the results obtained with the large net. Fishing operations were carried on 24 hours per day, and accurate positions were obtained by use of Loran.

*Fishery Engineer, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Seattle, Washington, and observer aboard the Albatross III from January 16 to February 21, 1950.

1/ See Commercial Fisheries Review, April 1950, pp. 39-43.


ICELAND OTTER-TRAWL NET (sections cut out of machine-made webbing)
UPPER HALF NET SECTION
Headrope - 76 Feet.
LOWER HALF NET SECTION
Footrope - 116 Feet.
TOP-WING, 6" mesh
LOWER-WING, 6" mesh
Bosom 12
40 m.
Bosom 20
90 m.
45 MESH SQUARE, 6" MESH
UPPER BELLY, 6" mesh
MIDDLE BELLY, 5" mesh
END BELLY, 4" mesh
COD-END, 3½" mesh
24 FEET
24 FEET
NOTE: The number of meshes shown here of the net-sections are 1/6 of the numbers indicated.
m. = meshes
" mesh

Numerous fish and invertebrates were taken in the catches, including many tropical and semi-tropical forms, a fact not surprising considering the high temperature of the water. Many catches contained in excess of 30 species of fish. Positive identification of the less common fish is yet to be made from type specimens submitted to the U. S. National Museum.

This summary report is concerned only with those fish which are considered to be of actual or potential marketable value to the commercial fishery. Detailed biological and oceanographic reports will be forthcoming at a later date. 2/

GENERAL OBSERVATIONS ON COMMERCIAL FISHING POTENTIALITIES

In general, from the commercial fisheries aspect, results were poor. Very few catches contained marketable species of sufficient size or quantity to make commercial fishing operations economically practical. Exceptions were rare catches of small scup, croaker, and spot--up to 1,500 pounds, and smaller hauls of good-sized gray sea trout (weakfish), snappers, groupers, king whiting (sea mullet), sea bass, and others.

The following is a list of food fish taken in these operations which might have commercial possibilities if caught in enough numbers:

Common Name	Scientific Name
Croaker	(Micropogon undulatus)
Scup (Northern porgy)	(Stenotomus chrysops)
Gray sea trout (weakfish)	(Cynoscion regalis)
Spot	(Leiostomus xanthurus)
Sea bass	(Centropristes striatus)
Red porgy	(Pagrus pagrus)
Red snapper	(Lutianus campechanus)
Vermilion snapper	(Rhomboplites aurorubens)
Butterfish	(Poronotus tricanthus)
King Whiting (sea mullet)	(Menticirrhus americanus)
Fluke (flounder)	(Paralichthys dentatus)
Whiting (silver hake)	(Merluccius bilinearis)
Black grouper	(Mycteroperca bonaci)
Red grouper	(Epenephelus morio)

The fishing was accomplished in four cruises. In the results by cruise, which follow, only tows which yielded significant catches are specifically mentioned.

RESULTS BY CRUISE

CRUISE 31A--(January 16 to 24): For the first cruise, 24 fishing stations were laid out in a corridor extending from 76° 30' W. longitude, south of Cape Lookout, to 75° 15' W. longitude off Cape Hatteras, in waters from 20 to 100 fathoms depth.

A total of 46 tows were completed, including several made north and east of Cape Hatteras for the purpose of obtaining croakers for tagging. Rollers and tickler chain were used on all tows. One very bad tear-up at Station 10, tow 1, (34° 33.8' N. lat.--75° 54.3' W. long.) and two smaller ones doing minor damage

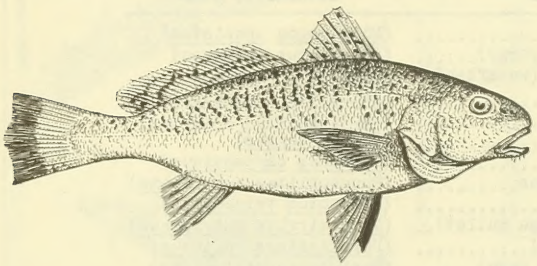
2/ A report on the biological phases of these cruises will be published in the near future by the Service's Branch of Fishery Biology. A report on the oceanographic phases of these cruises probably will be published by the Woods Hole Oceanographic Institution.

occurred; aside from these three instances, no obstructions to trawling with rollers were encountered. Two fishing days were lost because of strong northeast winds and rough seas on January 17 and 20.

Catches were generally poor, containing many small tropical fish. Commercial species were scarce. Up to 700 pounds of small filefish of no value were taken along with bottom trash, such as, sponges, small coral, etc. An average catch contained a bushel of assorted species.

Tow 2 in Station 10 (34° 30' N. lat.--75° 51.5' W. long.) produced 61 red porgy averaging 12 to 14 inches in length and weighing over a pound each. These were excellent fish, and constituted the best commercial prospects to that point. Tow 1 at Station 18 caught 6 red snapper weighing 22, 20, 9, 6, 12, and 11 pounds. Small numbers of scup, butterfish, sea bass, triggerfish, king whiting (sea mullet), groupers, and amberjack were taken of marketable size and quality, but never in quantities which would pay off for a commercial boat.

Several tows made in the waters north and east of Cape Hatteras produced catches of croaker up to several hundred pounds. These were on grounds already being fished by trawlers, and the fish were used for tagging purposes. Most were quite small, barely above marketable size (averaging 24 cm.--less than 10 inches in length).



VERY FEW OF THE CATCHES MADE BY THE ALBATROSS III IN THE OFFSHORE WATERS OF NORTH CAROLINA EARLY THIS YEAR CONTAINED MARKETABLE SPECIES OF SUFFICIENT SIZE OR QUANTITY. EXCEPTIONS WERE RARE CATCHES OF CROAKER (MICROPOGON UNDULATUS).

At Station 24, tow 1, 1,899 croaker, weighing 450 pounds were caught. In tow 1 at Station 22, 83 gray sea trout (weakfish) weighing 40 pounds were caught.

Miscellaneous species also occurring on this trip included spotted hake, tomtate, small flounders, whiting (silver hake), angel shark, sand shark of several hundred pounds, small squid, blue shark, sting rays, a few brown and coral shrimp, and numerous other tropical and semitropical forms.

Water temperatures were high, ranging from 69° to 75° F. at the surface. Bottom temperatures varied from 71° in the shallower waters to 52° near the 100 fathom curve. Catches made in the deeper, colder water produced no more, and in some cases less, fish than those in shallow, warmer water.

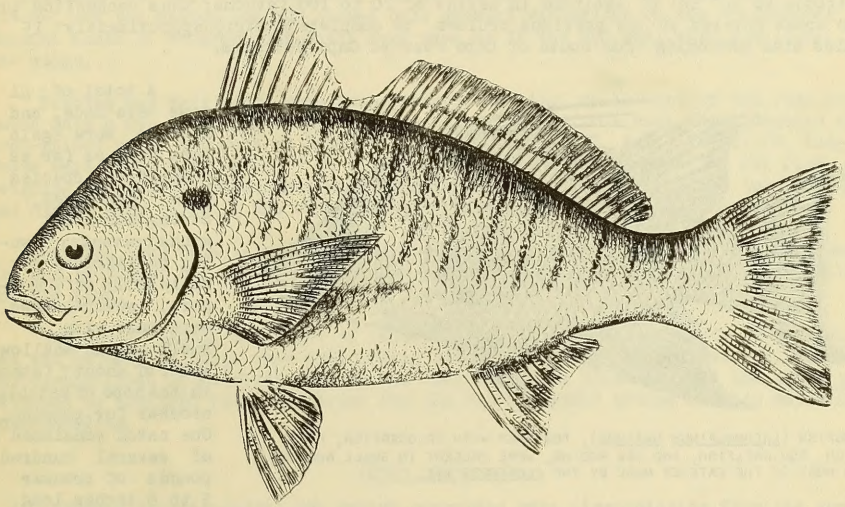
CRUISE 31B--(January 27 to February 2): On this cruise, 51 tows were made at 22 stations to the south of Cape Fear from 78° W. longitude to 76° 50' W. longitude and from the 100-fathom curve into depths of less than 20 fathoms. A strong northeast wind and rough seas prevented fishing on January 27 and 28, and shelter was sought off Southport in the lee of Cape Fear.

First tows were made in the early morning of January 29 with rollers in waters of 14 to 50 fathoms south of Frying Pan Shoals. The catch in Station 1 was predominantly rays (19 spotted eagle rays and 1 giant butterfly ray) plus 6 fair-sized fluke, and several miscellaneous species. Stations 2 to 7 produced catches of scup

(northern porgy) up to 6,000 fish per tow, weighing 1,500 pounds. These were quite small fish, from 6 to 8 inches in length, and although below normal marketing size, local fishermen expressed the opinion that they might have commercial value at times when the market was very good. Several hundred were tagged.

Tomtate (Bathystoma rimator), sometimes called redmouth grunt were also taken with the scup up to amounts of 1,450 fish, weighing 362 pounds. These were also small fish, but in excellent condition, and if of a larger size and found in greater numbers, could be a good commercial prospect.

Red porgy, vermilion snapper, triggerfish, sea bass, groupers, gray sea trout (weakfish), pinfish, and white grunt, were caught in smaller numbers. One grouper (or jewfish) weighing 240 pounds was taken in tow 3 at Station 7.



SPOT (LEIOSTOMUS XANTHURUS) WERE TAKEN IN SOME CATCHES BY THE ALBATROSS III, TOGETHER WITH CROAKER AND SMALL SCUP, IN WHAT WOULD BE TERMED "SIGNIFICANT QUANTITIES."

Tows made in Stations 8 to 11 in deeper waters from 60 to 92 fathoms were very unproductive, averaging only 13 pounds of various species per tow. The rollers were taken off after completing 11 stations and fishing was resumed in the area already covered with rollers, as a test of trawlability. No snags were encountered, and no appreciable difference in the catch was noted.

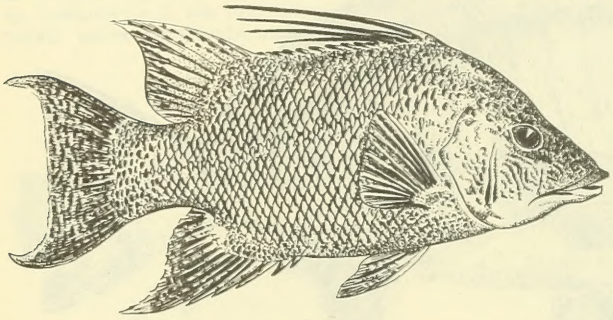
Stations 12 to 14 east of Frying Pan Lightship yielded very small catches, occasionally nothing coming up in the net. The largest catch was 500 pounds of small tomtate, scup, pinfish, triggerfish, and others. Several bottom hazards were met in this region. A bad tear-up occurred at Station 17, tow 2, (33° 17.5' N. lat.--77° 16' W. long.), destroying both wings and tearing the belly of the net. A small tear in one wing resulted at Station 18, tow 2. These tear-ups occurred when operating without rollers.

Rollers were put back on the footrope, and fishing resumed. At Station 20, tow 1, northeast of Frying Pan Lightship (33° 41' N. lat.--77° 29' W. long.), the net was lost on a very bad snag, only the doors and 15 floats being recovered.

Two tows in the shallow waters of Onslow Bay, made for the purpose of obtaining croakers for tagging, were unproductive.

Scup and tomtate appeared to be the best prospects on this cruise. Water temperatures were high--68° to 72° F. at the surface. Bottom water varied from 70° in 21 fathoms to 52° in 107 fathoms.

CRUISE 31C--(February 7 to 12): All tows at 14 stations on this cruise were made without rollers or tickler chain. No serious bottom hazards were encountered; only one very minor tear-up in 41 tows. The area worked extended from 33° 30' N. latitude to 34° 10' N. latitude in depths of 20 to 100 fathoms; thus connecting the two areas covered on the previous cruises to complete a strip approximately 15 miles wide extending from south of Cape Fear to Cape Hatteras.



HOGFISH (LACHNOLAIMUS MAXIMUS), TOGETHER WITH TRIGGERFISH, FILEFISH, SQUIRRELFISH, AND SEA ROBINS, WERE PRESENT IN SMALL NUMBERS IN MOST OF THE CATCHES MADE BY THE ALBATROSS III.

A total of 41 tows were made, and catches were again very poor as far as commercial species were concerned. Strong northeast winds prevented fishing on February 8. While lying off Southport, several tows were made with a small net in shallow water of about 7 fathoms in the hope of catching croaker for tagging. One catch consisted of several hundred pounds of croaker 5 to 6 inches long, which were too small for tagging. A few menhaden, up to a foot in length were mixed in this catch.

As on the previous cruise, small scup and tomtate were common, occurring in catches in various amounts up to 200 pounds, but averaging only 6 to 7 inches in length. Several times the cod end contained nothing, and the average catch was less than a bushel per tow. Triggerfish, hogfish, filefish, squirrelfish, sea robins, and other tropical species were present in small numbers in most catches.

A few red snapper, red porgy, grunts, and black grouper (weighing 20 to 25 pounds) were caught in commercial sizes, but never more than 8 or 9 per tow. One amberjack, weighing 19 1/2 pounds, was taken at Station 7, tow 3.

Probably the best commercial possibilities were found in several catches of vermilion snapper, taken in amounts up to 120 fish, weighing 64 pounds. These were prime fish, ranging from 10 to 14 inches in length and some exceeded over a pound in weight. It seems likely a ready market could be found for these fish if

they could be caught in profitable numbers. Station 8, tow 1, resulted in a minor tear-up in a top wing, which could have been due to fouling of the gear rather than a bottom hazard. There were small amounts of sponges and coral in some catches.

Several tows with the small try net in shallow water close to Cape Lookout caught nothing. Water temperatures were again high--70° to 73° F. at the surface. Preliminary examination of bathythermograph slides showed little change of temperature with depth in shallower waters (50 fathoms or less) but temperatures in deeper waters ranged between 55° and 65° F.

CRUISE 31D--(February 16 to 21): Fishing on this cruise was done without rollers in the area which was covered on Cruise 31A with rollers. A total of 24 tows at 6 stations were made and one snag was encountered, resulting in bad tears in the belly and wings of the net. This happened at Station 3, tow 1, at a position 34° 11.5' N. latitude--76° 06.5' W. longitude. No wrecks are shown on the chart near this position, and the bottom contour showed only gradual variations on the fathometer. Several hunks of conglomerate shell rock came up in the cod end, also some coral in the wings.

Fishing was very poor; some tows produced nothing, while most of the tows produced only a few pounds of scrap fish and bottom trash. One haul of 13 bushels of long-spined porgy was made at Station 4, tow 3, (34° 18' N. lat.--76° 17' W. long.). These were small fish again, 5 to 6 inches long, one bushel containing 492 fish weighing 61 pounds. Occasional whiting (sea mullet), fluke, sea bass, triggerfish, and others were caught. The water was very warm, 68° to 71° F. at the surface.

Several tows made in shallow water with the large net, bottom dredge, and small try net southwest of Cape Lookout caught nothing except a few starfish, sand dollars, and one crab.

Two days' fishing were lost on this trip due to difficulties with the Loran set and because of rough seas with strong southwest to northeast winds. Fishing was discontinued on February 21 when the wind failed to diminish, and the Albatross III returned to Morehead City to prepare for the oceanographic cruise back to Woods Hole, Massachusetts.

CONCLUSION

Although catches during the entire operation were disappointing from the commercial viewpoint, the information gained concerning the trawlability of the bottom is of much value in determining the possibilities of expanding the trawl fishery in these waters. In a total of 162 tows, only 4 bad snags were encountered. Thus it can be seen that a large percentage of the bottom is free of trawling hazards and could be fished effectively if fish were found to move into the area at other seasons.

The high-water temperatures encountered may be connected with the fact that the month of January was extraordinarily warm in North Carolina, being the second warmest January in 79 years in that State. It is possible, on fishing this area in an ordinary year when colder temperatures prevail, that different results from those recorded here would be obtained.

DEVELOPMENT OF TRASH FISHERY AT NEW BEDFORD, MASSACHUSETTS

by George W. Snow*

The port of New Bedford, Massachusetts, led all other New England ports in the production of trash fish in 1949, with landings of 44,115,000 pounds, valued at $379,624 to the fishermen. Total landings of trash fish in the New England area during that year exceeded 74.2 million pounds (Table 1).

Table 1 - Landings of Trash Fish in the New England Area by Ports, 1949

Locality	Thousands of Pounds	Percentage of Total
New Bedford, Mass...	44,115	59%
Gloucester, Mass....	14,567	20
Pt. Judith, R. I....	9,989	13
Stonington, Conn....	4,290	6
Provincetown, Mass..	1,283	2
Total.....	74,244	100%

The 1948 landings of trash fish at New Bedford were only 4,064,000 pounds and fur-farm operators purchased the entire amount in the round from a local dealer. In 1949, however, operators of reduction plants bought the entire catch for the preparation of meal.

Fish-meal producers in this city formerly relied on the byproducts of the fish filleting plants for their supply of raw material. Recently, a much stronger demand for fish meal was created by the greater utilization of the products in animal feeds. It is believed that a new feed formula for chicken diets developed by the University of Connecticut contributed a great deal to the increased use of fish meal. This new formula increased the fish-meal content of the diet by five percent and made it possible for the poultry producers to raise four sets of broilers per year, whereas only three sets had been raised using former formulas.1/ This increased the demand for fish meal during the past two years and stimulated the fish-meal producers to look for additional sources of raw material.

For some time, fish-meal operators had tried to get the smaller boats to fish for trash, but it was not until 1949 that they succeeded. Once started, several million pounds were landed per month during the remainder of the year (Table 2). These boats were induced to participate in this fishery at that time principally because of the relative scarcity of yellowtail flounder in the areas normally fished. During this period of scarcity, these boats could not fish on Georges Bank or Nantucket Shoals because most captains were not well acquainted with these areas, and also because their gear was primarily

Table 2 - The Landings of Trash Fish at New Bedford, Massachusetts, 1949

Month	Thousands of Pounds
January to March.....	0
April.....	3,536
May.....	7,363
June.....	7,936
July.....	6,905
August.....	4,945
September.....	2,737
October.....	5,491
November.....	3,336
December.....	1,866
Total.....	44,115

* Fishery Aide, Branch of Fishery Biology, U. S. Fish and Wildlife Service, New Bedford, Mass.

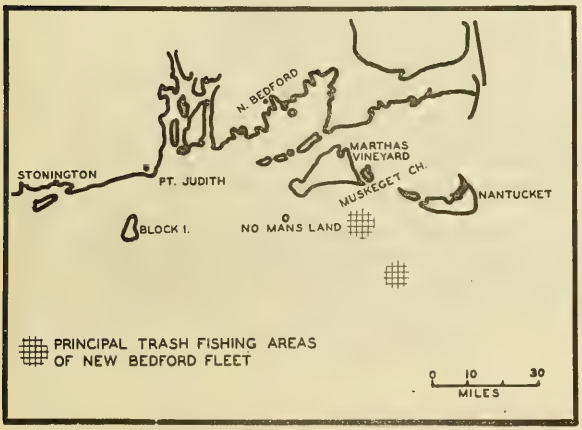
1/Boorsen, Fletcher V. The Wall Street Journal, August 27, 1949.

designed for the flounder fishery on the comparatively smooth bottom in the area between Block Island and Nantucket Lightship. The small boat owners and fishermen realized that, with large quantities of trash fish available and with an assured price for its sale, it would be possible to make a satisfactory profit during the shortage of yellowtail flounder, their usual mainstay.

The type of fishery which was established was called the "junk" or "trash fishery" because most of the fish that were caught had no marketable value for human consumption and, when caught incidental to normal trawling operations, were dumped back into the sea.

At the peak of the fishery during the summer months in 1949, and again in October 1949, 24 boats landed trash fish at New Bedford. These boats were small draggers with an average length of 51 feet and an average of 26 gross tons. Crew size varied from two to four men per boat. The same gear was used as in normal otter-trawling operations except that a liner of 1½ or 2-inch mesh was inserted in the cod end. Boat owners and fishermen claimed that this liner was necessary to strengthen the cod end due to the heavy weight of a haul of trash fish.

The New Bedford fleet concentrated its fishing in two areas. One area was in the vicinity of Muskeget Buoy, which marks the channel between Martha's Vineyard and Nantucket Islands; the other was 20 to 30 miles south south-east of No Mans Land. Fishing was carried on in the Muskeget area usually in 12 to 15 fathoms. In the area farther offshore, fishing was carried on in 20 to 25 fathoms.



During the first few months of the fishery and again in October, the average time required to get a full load was estimated at 8 hours. As the season progressed, however, fishing time increased to 12 and often to as long as 18 hours. The average catch for most of the boats was 30,000 to 35,000 pounds or more. When red hake, which comprised the majority of the catch, migrated offshore with the onset of cold weather, most of the boats reverted to their original fishery, as yellowtail flounder were again appearing on the fishing grounds. But, once more engaged in their basic fishery, the captains of the boats no longer had the trash fish dumped back into the sea. They augmented their catches, while fishing for yellowtail flounder, with the once-despised trash fish.

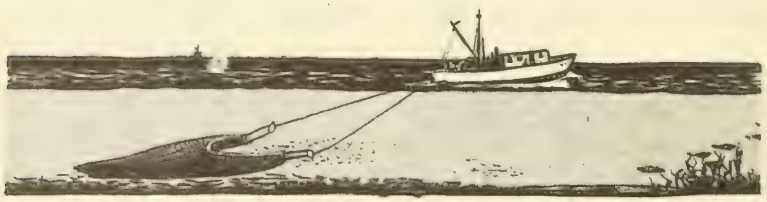
Port interviewers of the U. S. Fish and Wildlife Service, through personal observations and through subsequent discussions with buyers of trash fish and with captains of trash-fish boats at New Bedford, established that the red hake comprised an estimated 75 to 80 percent of the total landings during the summer. During the fall months, whiting appeared in larger numbers in the catch. At the close of the year, when both red hake and whiting were found in negligible amounts, the catch consisted chiefly of ocean pout, conger eels, and skates.

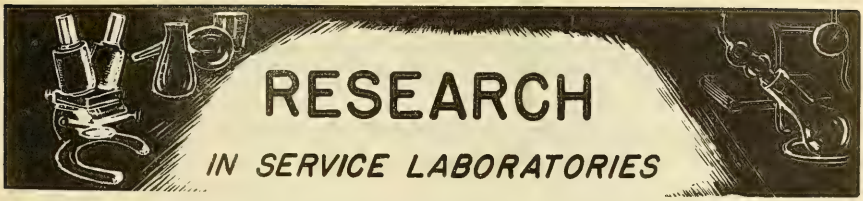
When reports were received that large numbers of immature fish of commercially important species (such as haddock, yellowtail, and blackback flounder) were being taken as trash fish, U. S. Fish and Wildlife Service representatives sampled the catch. This initial sampling could not be extensive, and a sample of the catch was obtained from only one boat. This was obtained from the Wanderer which landed at the port of New Bedford on October 26, 1949. The catch of this vessel can probably be considered indicative of the catch of the fleet for the period October 25 to 30, since during this time the fleet fished in a small area off Muskeget Buoy and all of the vessels used virtually identical gear. The sample, which weighed 305 pounds, contained the following:

Species	Numbers	Species	Numbers
Red hake	194	Flounders:	
Whiting	185	Daylight	5
Sculpin, longhorn	49	Four spot	2
Butterfish	31	Blackback	6
Squid	20	Sculpin, mailed	1
Skate, clearnose	15	Goosefish (Monkfish)	1
Sea robin	14	Dogfish, spiny	1
Scup	11	Alewife	1
		Total	536

The red hake, which comprised 36 percent of the sample by number, amounted to about 50 percent by weight. In addition to the species listed in the sample, torpedo and barn-door skates and hickory shad were noted in the catch.

This sample is indicative of the species composition of the catch at New Bedford in late October but, as was pointed out, there are large seasonal changes in the species taken. More adequate sampling is being carried out to determine if quantities of young haddock, yellowtail flounder, or other important edible species are being destroyed.





MAY 1950

REFRIGERATION: Frozen oysters treated with ascorbic acid and glazes received acceptable scores after two months of storage. Differences between test samples were somewhat greater than after the first month of storage but were not considered significant.

* * *

Results of tests on the storage of frozen pink salmon fillets during the 8 months of storage were as follows:

1. Storage life of pink salmon fillets:

Sample	Treatment of Fillets (Packaged in Moisture-vapor Proof Materials)	Storage Temperature	Storage Life (in months)
A	Untreated, skin off	0° F.	less than 3
B	Untreated, skin on	0° F.	3
C	Block frozen, water glazed	0° F.	7 to 8
D	Dipped 30 seconds in 2 percent ascorbic acid	0° F.	7 to 8
E	Coated with 0.3 percent ascorbic acid in a dilute solution of Irish moss Extractive or Low-methoxyl pectin	0° F.	6 to 7
F	Dipped for 30 seconds in 0.5 percent ascorbyl palmitate and 0.1 percent NDGA	0° F.	less than 6
G	Block frozen, water glazed	-20° F.	more than 8
H	Dipped in 2 percent ascorbic acid, block frozen, and glazed in 1 percent ascorbic acid	0° F.	more than 8
I	Dipped 2½ minutes in approximately 0.36 percent Griffiths G-4 antioxidant	0° F.	6

2. Two types of moisture-vapor proof packaging materials were used--0.0015-inch gauge polyethylene sheet and bags and 300 MSAT grade cellophane sheet. There were no significant differences in keeping quality of the fillets due to either of these packaging materials.

3. At the 0.3-percent ascorbic-acid level no significant difference was found when the two carrier agents (Irish moss extractive and low-methoxyl pectin) were compared.

4. The addition of 0.2 percent citric acid as a synergist to 2-percent ascorbic acid increased slightly the storage life of the fillets to a full 8 months and perhaps longer.

5. There was no significant improvement in keeping quality when an 0.5-percent wetting agent (either Emcol P1 50-3 or Emcol 14) was added to the 2-percent ascorbic-acid dip.

6. There was no significant improvement when 1-percent ascorbic acid was added to a water glaze.

* * *

PRESERVATION: Work on the development of preservatives for salmon eggs was continued. The following tabulation shows the chemicals which give satisfactory results, together with the cost of preserving one pound of eggs with a chemical or combination of chemicals:

No.	Preservative	Minimum Percent of Preservative	Cost of Chemical to Preserve One Pound of Eggs (Cents Per Pound)
1	Sodium Sulfite	0.5	0.40
2	Sodium Bisulfite	0.5	0.33
3	Sodium Sulfite Sodium Chloride	0.2 2.0	0.17
4	Sodium Bisulfite Sodium Chloride	0.16 2.0	0.11
5	Sodium Sulfite Sodium Benzoate Sodium Chloride	0.1 1.0 2.0	1.50
6	Sodium Bisulfite Sodium Benzoate Sodium Chloride	0.1 1.0 2.0	1.11
7	Sodium Benzoate Sodium Chloride	2.0 2.0	2.06
8	n-Butyl p-hydroxybenzoate Sodium Chloride	0.5 2.0	4.55

It was decided that chemical No. 8 was too expensive to consider, especially in view of the fact that other less costly chemicals gave satisfactory results. It was further decided that since sodium bisulfite gave results equally satisfactory to sodium sulfite and that the bisulfite was considerably cheaper, that future tests would be confined to use of the bisulfite. Accordingly, when large-scale experiments are begun in the next few months, it is planned to confine further tests to formulas No. 2, 4, 6, and 7.

* * *

NUTRITION AND COMPOSITION: Biotin assays were carried out by micro-biological methods on a number of the hatchery diets and hatchery raw materials. Further research was carried out on determination of folic acid in the hatchery products, but no satisfactory procedure has yet been obtained.

The data are being summarized on the project for the determination of food value of fishery products as prepared for serving. To date approximately 419 samples have been analyzed.

* * *

BYPRODUCTS: Samples of fish meals from various sources were assembled for cooperative tests on vitamin-B_{12} content with the Department of Agriculture at Beltsville, Maryland. Representative samples of various species of West Coast meal are being collected. Vitamin B_{12} will be determined at this laboratory by the microbiological method and results compared with assays carried out by the Department of Agriculture.

Several thousand pounds of salmon viscera are being processed into low-temperature dried meal for fish hatchery food for tests at the Leavenworth, Washington, hatchery. Other materials, such as fish livers, whole gray cod, hake, and animal-protein-factor concentrates are being collected for the feeding tests.

* * *

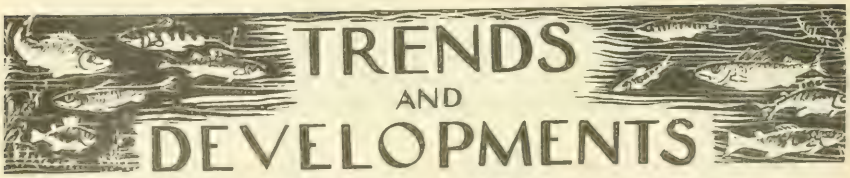
SANITATION AND QUALITY CONTROL: Studies on the cultural characteristics of the "pink" yeast isolated from oysters indicated that the organism is able to withstand wide variations of temperature. The ability of the organism to ferment sugars, such as dextrose and sucrose, is very slow.

* * *

LITERATURE ABSTRACTS: A system for preparing an index to Commercial Fisheries Abstracts is being considered. It has been observed that quite a few of the users of this periodical do not cut out the cards, but retain the bound issues of Commercial Fisheries Abstracts in their files. As time goes on, it becomes necessary to look through quite a large number of individual issues in order to find back material. It is planned that an index covering the first three years of Commercial Fisheries Abstracts will be prepared and issued as a Fishery Leaflet. A system of headings under which the abstracts will be listed has been worked out and preliminary classification of the first two volumes has now been completed.

* * *

CANNED FISHERY PRODUCTS: A method for the prevention of struvite formation has been developed, according to the Service's Boston Technological Laboratory. A patent application covering this method recently was filed by a New England research group. Struvites are crystals of magnesium ammonium phosphate which often form in canned fishery products and which are easily mistaken by the consumer for pieces of glass. These crystals have been a constant source of trouble in the canned fish industry and, occasionally, have been the basis of claims and law suits. Trouble has been encountered more with shellfish, such as canned shrimp, lobster, and crab meat, than with other varieties of canned fishery products, but struvites have been found in a good many of these products. If successful, the method of prevention recently developed would eliminate a source of annoyance to packer and consumer.



Additions to the Fleet of U. S. Fishing Vessels

A total of 107 vessels of 5 net tons and over received their first documents as fishing craft during April 1950--22 more than in April 1949. Alaska led with 29 vessels, followed by Washington with 17 vessels and Florida with 15 vessels, according to the Treasury Department's Bureau of the Customs.

During the first four months of 1950, a total of 249 vessels were documented, compared with 260 during the same period in 1949.

Vessels Obtaining Their First Documents as Fishing Craft, April 1950

Section	April		Four mos. ending with Apr.		Total
	1950	1949	1950	1949	1949
	Number	Number	Number	Number	Number
New England	5	1	12	3	35
Middle Atlantic	7	7	12	21	44
Chesapeake Bay	8	2	22	17	87
South Atlantic and Gulf	30	23	93	108	369
Pacific Coast	27	22	66	52	327
Great Lakes	1	6	4	21	38
Alaska	29	24	40	36	96
Hawaii	-	-	-	2	5
Unknown	-	-	-	-	1
Total	107	85	249	260	1,002

Note: Vessels have been assigned to the various sections on the basis of their home port.

ECA Procurement Authorizations for Fishery Products

The Economic Cooperation Administration did not announce any new procurement and reimbursement authorizations for fishery products (edible and inedible) during June this year. There was one cancellation of a previous authorization--$1,250,000 authorized for Greece for the purchase of salted fish from Canada (including Newfoundland). In this instance, Canada could not supply the type of salted fish desired by Greece.

From April 1, 1948, through June 30, 1950, total ECA procurement authorizations totaled $28,286,000 ($16,296,000 for edible fishery products, $10,450,000 for fish and whale oils, and $1,540,000 for fish meal). Of the total authorizations for fishery products, $8,945,000 was used for purchases in the United States and Possessions ($6,822,000 for canned fish and $2,123,000 for fish and whale oils).

In addition to the usual edible and inedible fishery products, during June ECA authorized $5,000 for the purchase of fish glue from the United States and Possessions for delivery to the Netherlands (not included in the totals given above).

In a further move to promote increased dollar exports from Marshall Plan countries and thereby help to close the dollar gap, the ECA in June announced the undertaking of a special study of import and export financing procedures in the United States and abroad. The study will have as its object recommendations for improvement of export credit facilities in Europe and import credit facilities in the United States, with special emphasis on the financing of inventories from which quick deliveries can be made to dollar markets. All credit aspects of European exports to dollar markets from the financing of the raw materials in the producing countries to final distribution through wholesale and retail channels in the United States will be covered.

Trade between the Marshall Plan countries reached a postwar peak in March this year of 126 percent of prewar volume. In the June issue of its bimonthly publication Recovery Guides, ECA listed the new trade peak as one of the significant developments in Western Europe's efforts to narrow the dollar gap. It was pointed out that by purchasing from each other, the Marshall Plan nations are able to cut down the quantity of goods they would otherwise have to buy in dollar areas. Other important developments reported during the period since the Western European countries revalued their currencies in September 1949, were a rise in the Marshall Plan countries' foreign trade, an increase in hard-currency reserves, a new postwar peak in Western Europe's industrial output, and a decline in the U. S. trade surplus.

THE ABOVE POSTER, SUBMITTED BY PIERRE GAUCHAT OF SWITZERLAND, WAS AWARDED SECOND PRIZE AND THE FOREIGN CURRENCY EQUIVALENT OF $1,000 IN AN INTRA-EUROPEAN MARSHALL PLAN POSTER CONTEST SPONSORED BY ECA.

ECA called significant the reappearance for the first time since the war's end of a deficit in the U. S. trade balance with Latin America and the overseas sterling area. The recovery agency said this development "opens up the possibility for a resumption of the prewar multilateral trading pattern by which Western Europe earned dollars with which to cover part of its dollar deficit with the United States."

Included in the lists of import license requests (covering the purchase of equipment from the United States under ECA financing) which have received preliminary approval from the Italian Government, were the following: 5 marine engines (140 to 155 h.p.) with an approximate value of $5,700 and 50 outboard motors

for fishing boats with an approximate value of $16,000. These lists were released in June, and although the items were approved by the Italian Government, these purchases have not yet been approved by ECA.

New Assistant-Chief Position Established for Branch

Responsibilities of the Fish and Wildlife Service in administering an expanding program of commercial fishery activities have made it necessary to establish an additional assistant-chief position in the Branch of Commercial Fisheries, the U. S. Department of the Interior announced June 26.

This new position was filled in June by the transfer of Fred F. Johnson, from Honolulu, T. H., where he had served as assistant director of the Service's Pacific Oceanic Fishery Investigations since August 1948. Previous to that assignment, he had been assistant regional director in the Service's regional office in Portland, Oregon, for six months. Johnson, who has an extensive knowledge of the fishing industry and fishery economics, returns to a position which he formerly held for 13 years.

Richard T. Whiteleather is the other assistant chief of the Service's Branch of Commercial Fisheries. Andrew W. Anderson is chief of the Branch.

Federal Purchases of Fishery Products

DEPARTMENT OF THE ARMY, April 1950: Fresh and frozen fishery products totaling 993,562 pounds (valued at $434,940) were purchased during April this year by the Army Quartermaster Corps for the U. S. Army, Navy, Marine Corps, and Air Force for military feeding (see Table). April purchases were up 20 percent in quantity and 3 percent in value as compared with March. However, April purchases this year were down 28 percent in quantity and 11 percent in value as compared with the corresponding month a year earlier.

Purchases of Fresh and Frozen Fishery Products by Department of the Army
(April and the First Four Months, 1949 and 1950)

Quantity				Value			
April		January-April		April		January-April	
1950	1949	1950	1949	1950	1949	1950	1949
lbs.	lbs.	lbs.	lbs.	$	$	$	$
993,562	1,386,475	3,562,406	5,340,704	434,940	487,851	1,622,400	1,820,823

Total purchases for the first four months this year were below the corresponding period in 1949 by 33 percent in quantity and 11 percent in value.

Fish and Wildlife Service School-Lunch Program

A series of fish cookery demonstrations, designed to increase fish consumption in school-lunch programs and show better methods of fish preparation, will be held this fall in Connecticut, Rhode Island, and Mississippi by home economists and fishery marketing experts of the Fish and Wildlife Service.

Working in cooperation with state boards of education and the state supervisors of the school-lunch programs, the Service home economists and marketing experts will demonstrate different methods of preparing fish and will talk on local fish marketing conditions and problems of supply. About 20 demonstrations are planned in Mississippi and 8 in Rhode Island, during October; and 10 or 12 demonstrations in Connecticut, during November.

In the demonstrations, the home economists make use of local species of fish, when available. The fishery marketing experts, having previously surveyed the area, describe the fish which are available, discuss prices, markets, and other problems of distribution, and act as expediters between producers, local markets, and the schools which purchase the fish.

School-lunch demonstrations in California, where work has been done for two years, will continue this fall--centering in the Los Angeles area. The group will hold several demonstrations in the San Francisco area after the first of the year.

Following demonstrations in Virginia schools last year, the use of fish in a sample survey of 126 schools indicated an increase of more than 100 percent. Similar results were noted in Georgia, Massachusetts, North Carolina, and California. Occasional demonstrations also were held last year in Maryland, Florida, Tennessee, Mississippi, and Washington.

The Service's new film on the use of fish in the school lunch program, Food for Thought, will be shown in conjunction with this year's demonstrations.

Fishery Biology Notes

1949 LONG ISLAND SOUND OYSTER SET POOR: Observations by the staff of the Service's Shellfishery Laboratory at Milford, Conn., on the Long Island Sound oyster (Ostrea virginica) set of 1949 showed it to be one of the poorest of the past 15 years. However, because of the relatively high rate of survival and rapid growth, the set resulted in a crop of commercial value in some sections, especially in the Bridgeport area. Setting extended from July 10 to September 15, 1949. Such an early beginning of setting was without precedent in the experience of the laboratory.

From an ecological viewpoint, it is important that the set was rather light regardless of the comparatively high temperature of the water. This shows once more that the departure of the temperature above the normal does not necessarily guarantee a good set of oysters in Long Island Sound.

Great Lakes Fishery Investigations

PROGRESS OF SEA LAMPREY INVESTIGATIONS: Prior to the establishment of the sea lamprey investigations as part of Great Lakes Fishery Investigations in October 1949, the Fish and Wildlife Service had been able to carry out only scattered and short-term studies of the problem. Since that time, great progress has been made in the organization of a long-term program for the development and testing of methods of controlling this parasite and operations have actually been started on the important phases of that program, according to a June 20 progress report.

An enlarged central office has been established in Ann Arbor, Michigan, and in order to place trained observers as near as possible to the "trouble centers" of the Great Lakes, field stations have been set up at Hammond Bay, near Rogers City,

LARVAL FORMS OF THE SEA LAMPREY OF THE GREAT LAKES. UPPER - SIDE VIEW OF UNTRANSFORMED LARVA ABOUT 4⅜ INCHES LONG. CENTER - EARLY EYELESS STAGE, ABOUT 1⅝ INCHES LONG. LOWER - SAME AS UPPER, BUT VENTRAL VIEW SHOWING UNTRANSFORMED MOUTH PARTS.

Michigan, on Lake Huron; Marquette, Michigan, on Lake Superior; and Sturgeon Bay, Wisconsin, on Lake Michigan. The first named of these stations is the operating

headquarters for the sea lamprey work, but the staff of the other two stations will contribute to special phases of the sea lamprey studies.

The sea lamprey investigations may be divided broadly into the following phases: development and testing of control devices and procedures, including the accumulation of reasonably exact data on costs of installation and operation of various devices; extension of studies on the life history and habits of the sea lamprey with a view toward determining better the vulnerable stages of the life history; surveys of streams to ascertain the distribution of sea lamprey runs, the extent of available spawning grounds and larval habitats,...; studies of species subject to attacks by sea lampreys to learn the incidence of attacks and the effects on abundance.

Control Devices and Techniques: PHYSICAL BARRIERS: Inasmuch as mechanical devices--weirs, traps, dams,...--for the blocking and/or capture and destruction of spawning-run sea lampreys at the time of their entrance into streams tributary to the Great Lakes constitute the only proven effective means for controlling the sea lamprey, the Service's first year's program is concentrating on that type of structure. The major center of activity for this work is the northern part of the lower peninsula of Michigan where weirs and traps have been installed in each of the 12 streams in an experimental control zone extending from Waugachance Point at the west end of the Straits of Mackinac to Alpena, Michigan. These structures are making it possible to capture the entire spawning run on this stretch of shore. As of June 9, 20,251 spawning migrants have been captured in the area.

On Lake Superior a weir is in operation on Pendill's Creek, a tributary of Whitefish Bay, but because of the colder water and the consequently later run, only three lampreys have been captured.

Through a cooperative arrangement with the Wisconsin Conservation Department, 5 weirs are in operation in streams of that State tributary to Lake Michigan. Materials and technical advice on the construction of these structures were supplied by this Service. Through June 1 the Wisconsin weirs took 13,406 sea lampreys.

Another and similar cooperative agreement with the State of Indiana lead to the installation of a weir in Trail Creek, a tributary of southern Lake Michigan. Many lampreys were taken but damaging floods necessitated the weir's removal.

These numerous weirs are serving two purposes. First, they are achieving a certain measure of control, particularly in the section of shore where all streams are blocked. Second, they are providing information and experience on the type of construction needed under various stream conditions and are yielding data on the cost of installation and operation of the various structures.

In cooperation with the Michigan Department of Conservation, experiments are being made in the Black River, a tributary of northern Lake Michigan, on the possibility of using low barrier dams to block spawning-run sea lampreys but at the same time permit the free upstream movement of rainbow trout. This type of structure has the advantage of requiring little attention and hence of having a low cost of operation. Early reports on this barrier dam are highly encouraging.

As an adjunct of studies of barrier dams, it is important to know the fate of spawning-run sea lampreys that find their upstream movement blocked and are forced to return to the lake. Accordingly, an experiment has been initiated in which

more than 3,000 sea lampreys were tagged in the mouth of the Cheboygan River, a stream containing an impassable dam a short distance above its mouth. These lampreys are being recovered by fishermen and in our own structures in neighboring streams.

As a preliminary to a proposed early extension of the previously-mentioned control zone to include all of the United States shore of Lake Huron and part of northern Lake Michigan and the possible ultimate extension of these zones throughout the Great Lakes, engineers of the Service are conducting studies to determine the type of construction and the approximate cost of physical barriers in streams characteristic of the Great Lakes. Information from these engineering investigations will be used for the estimation of the total cost of a control program based entirely on physical barriers.

A WEIR INSTALLED BY THE FISH AND WILDLIFE SERVICE ON THE OCQUEOC RIVER, MICHIGAN, FOR BLOCKING, CAPTURING, AND DESTROYING SPAWNING-RUN SEA LAMPREYS.

OTHER CONTROL STRUCTURES: In view of the high construction, maintenance, and operational cost of physical barriers, the possible usefulness of other types of barriers is being checked. To carry out this highly specialized and technical work, an engineering contract has been let for the development of electric, sonic, light, and electromagnetic devices that may serve to block or destroy spawning-run migrants or kill young sea lampreys enroute downstream to the lake.

The Service plans also to install and test a commercially available electric screen which the manufacturer offers to guarantee as effective for the blocking of spawning-run lampreys without harm to or interference with the movements of fish.

INTRODUCTION OF AMERICAN EELS: In aquarium experiments conducted by staff members, American eels have proved themselves to be predators on larval sea lampreys. Experiments have been planned in natural streams to determine whether the introduction of eels might prove useful as a control measure. These experiments are to include observations on the effects of eels on native fish as well as sea lampreys.

Studies on the Sea Lamprey: These investigations are designed to gain information on the life history, habits, and physiology of the sea lamprey that might contribute toward the development of more effective control methods. Some of this work is being carried out by the Service's staff and some through cooperative arrangements with universities.

Facilities are being prepared at the Hammond Bay Fishery Laboratory for experiments on the toxicity of various substances to young lampreys. The problem here is to discover a specific toxicant and methods of applying it in natural streams so as to destroy larval lampreys with a minimum of damage to fish.

Counts continue to be made and biological data collected on sea lampreys taken in weirs in order that the Investigations may be able to determine immediately any significant change in the numbers in the runs and in the lengths, weights, and sex ratio...of lampreys.

Stream Surveys: Two fully equipped stream survey parties of four men each are now in the field for the purpose of examining all streams tributary to Lake Superior on the United States side and streams flowing into Lake Michigan on the south shore of the Upper Peninsula of Michigan and in the upper part of Wisconsin. The objectives of these survey parties include an appraisal of the current distribution of lamprey spawning runs, a cataloging of streams in which runs might become established, the estimation of the extent of spawning grounds and habitat for young sea lampreys, and the measurement and study of possible sites for weirs and other control structures. This work will be assisted by spot checking by staff members of the Marquette and Sturgeon Bay field stations.

Studies of Fish Attacked by the Sea Lamprey: Although seemingly every species of fish in the upper Great Lakes is subject to attack by the sea lamprey, and damage by that parasite to whitefish, suckers, walleyes,... is increasing to an alarming extent, the lake trout is by far the species that has suffered the greatest harm to date. Annual losses to fishermen as the result of declines in the production of this species in Lakes Huron and Michigan can be estimated conservatively as close to 2-1/2 million dollars. Only in Lake Superior is the lake trout still reasonably plentiful, and even there predation by sea lampreys appears to be increasing.

Because of the importance of saving the lake trout in Lake Superior and of attempting the early rehabilitation of the stocks in Lakes Huron and Michigan, a full-time biologist has been assigned to the investigation of the species with particular reference to its relationship to the sea lamprey. Biologists at the Marquette station are now carrying out observations on the incidence of scarring of lake trout and other species by the sea lamprey.

The drastic decline in the production of lake trout has led to such a shifting of fishing pressure to other species as to threaten them with overfishing. In recognition of this danger, a close watch is being kept on those fisheries both by careful statistical studies of trends of abundance and by direct biological investigation. The staff at Sturgeon Bay, Wisconsin, for example, is devoting much attention to the vitally important fisheries of Green Bay, in which area fishing intensity has increased tremendously.

Research Vessel: Specifications and plans have been completed for a new 60-foot vessel, construction of which is scheduled to begin in the immediate future. Contract for this vessel has been awarded. When this boat is placed in operation it will be possible to study certain aspects of the sea lamprey's life cycle on which only fragmentary information is available now. It will be possible also to experiment on possible methods of capturing and destroying lampreys during their lake life, especially in the fall and winter when they appear to be concentrated off the mouths of streams.

The vessel will permit test-netting as a check on the abundance of lake trout and other species and to collect much needed data on the biological, physical, and chemical conditions in lakes that affect the distribution and abundance of lake trout and other fish.

International and Interstate Cooperation: The Great Lakes Sea Lamprey Committee, now in existence for several years, has served as a means of coordinating research and control activities by this Service, the Great Lakes States, and the Province of Ontario. The Chief of Great Lakes Fishery Investigations serves as chairman of the Committee.

Despite the usefulness of the Committee as a general coordinating body, a more detailed coordination and integration of activities than can be had through the Committee is needed to effectuate the type of cooperative project of which numerous examples were cited earlier in this report and which are planned for subsequent seasons. Accordingly, separate conferences have been held with officials of the Province of Ontario and of the States of Michigan and Wisconsin in which numerous specific questions of cooperation have been discussed and many solved. Participation by Michigan and Wisconsin in the sea lamprey program is greatly restricted by the limited funds allotted to that work by these States.

Gulf Exploratory Fishery Program

"OREGON" LOCATES LITTLE TUNA, SHRIMP, AND FLATFISH: Tuna were located by the Oregon, the Service's Gulf Exploratory Fishery Program vessel, on its second cruise. After the Oregon left Pascagoula, Mississippi, on June 8, the vessel worked east of the Mississippi River mouth near the 100-fathom curve and south to Dry Tortugas. It was necessary to return to Pascagoula on June 17 for repairs to the main engine. The cruise was continued on June 22 and was concluded on June 29.

Tuna Observations: Little tuna, Euthynnus alletteratus, were taken on trolling lines frequently between Pascagoula to Tortugas, inside the 100-fathom curve, but the maximum number taken from any one school was six. Those taken south of the latitude of Tampa, Florida, were larger (average weight 11 pounds) than specimens taken farther north, off Pascagoula and Pensacola.

A school of a larger species of tuna was sighted about 45 miles southeast of Pensacola feeding along a drift of sargassum weed, where small fish and invertebrates are extremely abundant, but the fish were too wild to approach. These fish were believed to be the Atlantic blackfin tuna. The presence of the sargassum interferes with the conventional methods of tuna fishing as practiced in the Pacific and also effective trolling.

Both the little tuna and the blackfin tuna are of commercial interest, but the latter are believed to be of particularly good quality. Observations on these two Gulf tunas indicate that they feed in small schools and, at this season at least, are often found to be gorged with small fish and squid.

Shrimp Observations: Shrimp trawl drags were made at two stations in depths from 16 to 120 fathoms, but commercial species were not taken at depths of over

50 fathoms. A few specimens of Peneus duoarum (brown-spotted shrimp) were taken in a drag in 28 fathoms near Dry Tortugas and both P. duoarum and P. aztecus (brown or grooved shrimp) were obtained from hauls made in about 15 fathoms off Mobile. In this area approximately 30 percent of the shrimp were P. duoarum which were appreciably larger than the P. aztecus from the same drags.

Other Observations: A single set with a long line on the bottom in 105 fathoms produced only a few sharks, but many of the lighter hooks were torn off.

All four drags with a shrimp trawl in 100 to 120 fathoms produced a few flatfish, Paralichthys sp. This indicates the need for further investigation of the possibilities for use of an otter trawl for fish in the deeper Gulf waters.

Two specimens of a fish related to the tilefish were secured. These fish, Caulolatilus sp., are large enough to be of commercial interest if obtainable in quantity.

"OREGON" ON CRUISE NO. 3: A series of stations extending into the Gulf of Mexico along the 88th or 89th meridian southward of Pascagoula as far as the 26th parallel will be worked by the Oregon, the Service's Gulf Exploratory Fishery Program vessel. The vessel left on July 11, and the cruise will be divided into two or three parts, with return to Pascagoula for installation of loran and other equipment.

Shrimp trawl drags will be made during the day and night at intervals of about 5 fathoms in depths to about 200 fathoms. Navigating equipment will be checked, and a bathythermograph (plots temperatures against pressure to depths of 150 fathoms) is now available aboard the Oregon.

Indo-Pacific Fisheries Council Meets in Australia

The Indo-Pacific Fisheries Council held its Second Annual Meeting at Cronulla, N. S. W., Australia, from April 17 to 28, 1950. The Council's purpose is bringing together administrators and technicians from the various nations of southeastern Asia and areas of the western and southwestern Pacific in order to discuss fisheries problems and to coordinate programs for the development of aquatic resources of the Indo-Pacific Region. The immediate aim is to increase production which in turn will improve the food supply and diet of the indigenous people.

The meeting was attended by 35 representatives of 11 of the 14 Member Governments of the Council. Representatives were also present from SCAP, UNESCO, and the South Pacific Commission, according to a May 26 news release from the Council. The United States delegates were O. E. Sette, Director of the U. S. Fish and Wildlife Service's Pacific Oceanic Fishery Investigations, and Charles Butler, Chief of POFI's Technological Section.1/

The Council Area stretches from Hawaii to Pakistan and from Korea to Australia. Japan is included in the geographical sector comprising the additional land masses of Indo-China, Formosa, China, and Korea. The importance

1/ See Commercial Fisheries Review, May 1950, pp. 91-2.

of developing the fisheries of this vast region is emphasized by the shortage of agricultural production necessary for feeding the great density of population in the Indo-Pacific area.

The work of the Council is conducted by two technical committees; one dealing with technology and the other oceanography and biology. The Natural Resources Section of SCAP reports that the discussions by these committees at the second annual meeting emphasized the need of basic information on the fisheries of member nations of the Council to provide a practical plan for maximizing aquatic production. The latter objective is complex, involving conservation or proper utilization of the resources, modifications in the operations of gear, and technological improvements in the handling of fisheries products. Social and economic aspects also must be considered in the development of an industry upon which people depend for their livelihood or partly for their subsistence. Various phases of this over-all program are to be weighed against the need to effect immediate improvements in the food supply without jeopardizing the future sustained productivity of the fishing grounds.

Considerable interest was shown in the possibility of introducing into local areas types of fishing gear and modifications of fishing operations which had proved successful in increasing or maintaining high levels of catch in other countries. Introduction of such nonindigenous gear will have to be adjusted to social and economic structures of the local communities and accompanied by a program of education in conjunction with government assistance and financial support. Some failures have already been experienced by introducing highly mechanized types of Occidental fishing gear in some southeast Asia countries without proper consideration of local conditions and the ability or desire of the local fishermen to adopt the new methods.

The Council showed interest in obtaining direct technical assistance for its member nations from the Four-Point Programs for economic development which are being proposed for different parts of the world.

The Council also organized plans to standardize procedures and equipment in the conduct of scientific fisheries studies, to permit greater usefulness of such data by research units operating in different areas but on problems of related interest.

At meetings of the technical committees, information was presented on Japanese fisheries. These presentations featured descriptions and methods of operations of various types of gear and the manner by which fisheries production in Japan has been restored to a level comparing favorably to that of the prewar period within present SCAP-authorized fishing areas. The contribution of the Japanese fishing industry in maximizing production and thus significantly contributing to the economic recovery of Japan was of special interest to the delegates of the southeast Asia nations. Proper development of their own fisheries will contribute significantly to the solution of complex economic problems.

North Atlantic Fishery Investigations

"ALBATROSS III" AIDS IN GULF STREAM OBSERVATIONS (Cruise No. 36): The Albatross III was one of six vessels which cruised along the Gulf Stream from off Nantucket to near the Grand Banks making simultaneous observations of the location

and features of the Gulf Stream from June 6-19. This operation was under the direction of the U. S. Navy Hydrographic Office and other ships participating included vessels of the Woods Hole Oceanographic Institution, the Canadian Navy, and the U. S. Navy.

All of the vessels maintained regular observations of ocean temperature, weather, wind velocity, position, and ocean currents while they were zigzagging along the northern edge or Cold Wall of the Gulf Stream. Findings indicated that the Gulf Stream follows a rapidly changing, meandering course and sends off eddies, two of which were located and surveyed.

In addition to the oceanographic observations, the Albatross III of the Service's North Atlantic Fishery Investigations trolled for surface fish. Only 5 dolphin were caught, all in the Gulf Stream west of longitude 63°00'. In addition, several tuna-like fish were lost and schools of tuna-like fish sighted in this same area. However, most of the fishing was conducted east of the 63°00' line where no fish were caught or sighted. Apparently some factor other than temperature influenced the migrations of these fish, for temperatures in the Gulf Stream were substantially the same east of 63°00' as they were where the fish were taken.

North Pacific Exploratory Fishery Program

"JOHN N. COBB" LOCATES FIRST ALBACORE TUNA OF THE SEASON: The first albacore tuna of the season was located and caught on June 18 by the John N. Cobb, the Service's North Pacific Exploratory Fishery Program vessel. A relatively small quantity of the tuna were taken at a position approximately 485 miles west of Cape Blanco, Oregon (42° 12' N., 135°05' W.), according to a radio message from the vessel. The vessel is on a four-month cruise in the offshore waters of the North Pacific to locate commercial concentrations of albacore tuna; determine their pattern of abundance; trace their general migration in the waters off Oregon, Washington, and Southeastern Alaska; and determine the most effective means of capturing the tuna commercially.

Based on scientific information obtained during last year's albacore tuna exploration in the North Pacific, combined with all available data on currents, water temperatures, and climatic conditions in the area, the vessel's fishery engineers were able to predict that albacore tuna could be expected in the area indicated above in its early stage of inshore migration.

The John N. Cobb is now attempting to follow the migration pattern of the albacore as they move northward, and to determine when the tuna will be in areas within reach of the commercial fishing vessels of Oregon and Washington.

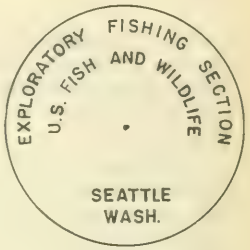
Each day at 2:00 p.m. (Pacific Standard Time), the vessel broadcasts its findings to the fleet on 2616 KC.

"JOHN N. COBB" TAGGING ALBACORE TUNA: In order that the direction and speed of the albacore movements in the North Pacific area may be determinded more accurately, a number of these fish encountered offshore are being tagged by the John N. Cobb, the Service's North Pacific Exploratory Fishery Program vessel. If returns can be obtained, they will be of great assistance in keeping the vessel on the albacore as they move during the season, and also will permit more accurate advice to the commercial fleet as to good fishing locations for this species. The

vessel is now tagging albacore off southern Oregon and will continue to tag fish for several months in waters along the coasts of Oregon, Washington, British Columbia, and Alaska.

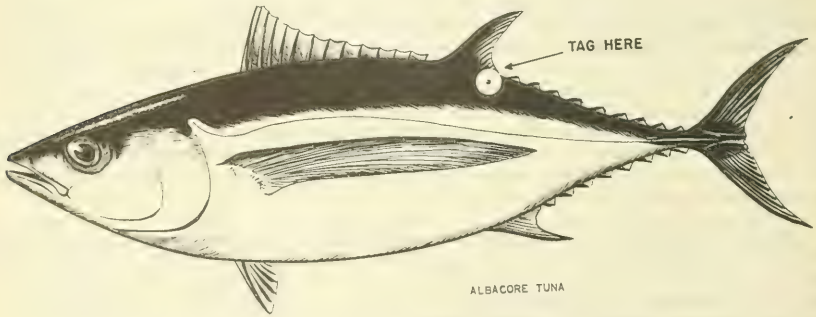
NO.1. NUMBERED TAG (YELLOW) 9/16" DIAMETER

The tags used consist of two plastic discs which are slightly larger than $\frac{1}{2}$ inch in diameter. The discs, one yellow and one red, are placed on both sides of the second dorsal fin (top fin), and are joined together with a nickle pin which pierces the lower part of the fin near the body of the fish.



NO.2. INFORMATION TAG (RED) 9/16" DIAMETER

If found by fishermen or plant operators, both discs should be mailed to the following address: Exploratory Fishing and Gear Development Section, Fish and Wildlife Service, 2725 Montlake Boulevard, Seattle, Wash. The following information should accompany the tags: (1) where caught; (2) date caught; (3) length and weight; and (4) remarks as to damage to fish from tag.



THE TAG DISCS ARE PLACED ON BOTH SIDES OF THE LOWER PART OF THE SECOND DORSAL FIN (TOP FIN), AND ARE JOINED TOGETHER WITH A NICKLE PIN.

Pacific Coast Halibut Season Shortest on Record

The halibut season on the West Coast this year was the shortest on record. This year's closing date ended halibut fishing in the North Pacific after 66 days of fishing, compared with 73 days in 1949, 72 days in 1948, and 109 days in 1947.

The closing of the halibut season in Areas 1A, 3, and 4 at 12 midnight, July 5, 1950 (announced on June 15 by the International Fisheries Commission) terminated all halibut fishing on the Pacific Coast of Canada and the United States,

including Alaska, except for incidental halibut catches. Permits for the retention and landing of halibut caught incidentally to fishing for other species with set lines in any area will become invalid at 12 midnight, November 15, 1950, when the closed season for all halibut fishing starts.

Areas 1B and 2 were closed at midnight June 1, 1950 (see Commercial Fisheries Review, June 1950, p. 21).

The halibut season opened on May 1 and the quota again was 54 million pounds (see Commercial Fisheries Review, May 1950, pp. 34-5).

Pacific Oceanic Fishery Investigations

"JOHN R. MANNING" TESTS WEST COAST PURSE SEINE IN LINE ISLANDS REGION (Cruise 2): Testing a West Coast purse seine in the Line Islands region was the primary purpose of the John R. Manning's second cruise. The area in which net could be operated was found to be limited by weather, with the lees of the Islands offering the best conditions. Fishing at Kingman Reef, Palmyra Island, Washington Island, Fanning Island, Christmas Island, and Jarvis Island, the vessel's staff observed that schools of tuna were found to be rather fast moving and erratic, but on several occasions schools were seen which might be caught by this gear. Two sets were made on yellowfin tuna. The first set was at Fanning Island on May 8; the second was at Christmas Island on May 13. Both sets were unproductive, but fish did remain in the net for a longer period of time during the second set. The average time spent for each set was 2½ hours, beginning with the running out of the seine until the net and all gear was secure aboard again.

Over a period of 43 days, 308 hours were spent surface trolling in the near vicinities of the islands--7 surface-trolling lines were fishing most of this time. The yield of this gear was:

Species	No. of Fish	Total Weight	Species	No. of Fish	Total Weight
Yellowfin tuna...	881	29,590	Barracuda.....	3	26
Oceanic skipjack.	14	130	Rainbow runner....	48	120
Black skipjack...	1	24	Numerous sharks...	-	-
Wahoo.....	181	5,838			

Best trolling catches were made at Kingman Reef, followed by Washington and Palmyra Islands.

Stomachs, gonads, and size-frequency data on tunas were taken to contribute to life-history studies. Bathythermograph sections were taken between Kingman Reef and Oahu both on the outward and homeward-bound runs and bathythermograph casts were also made at intervals on the fishing grounds.

Night lighting in the lagoons at Kingman Reef and Palmyra Island, and at the outside anchorages at Christmas and Fanning Islands, yielded no results in the way of tuna bait. Fair quantities of small mullet were observed on the beaches at Palmyra Island, but there would be some difficulty transporting them to a fishing vessel because of the lack of small-boat passages in the lagoon.

The vessel left Pearl Harbor, T. H. on April 17 and returned to port on June 14.

"JOHN R. MANNING" TO FISH TUNA WITH PURSE SEINE (Cruise No. 3): Experimental fishing operations with a tuna purse seine will be conducted in the waters of the Phoenix Islands by the John R. Manning, research vessel of the Service's Pacific Oceanic Fishery Investigations. The vessel left Pearl Harbor about July 15 and is expected to return to port about September 25, 1950. Efforts of the vesselwill be directed toward developing effective techniques for using purse-seine equipment in the capture of tunas. While both yellowfin tuna and skipjack occur in that region, it is not known whether or not they are susceptible to present methods of seine fishing. Further, efforts will be directed toward estimating the commercial abundance of tunas in the Phoenix Islands. The John R. Manning will work in conjunction with the Henry O'Malley in an attempt to capture tuna schools with a seine after the latter has stopped the school and concentrated the fish by chumming them with live bait.

In addition, a number of secondary projects will be carried out. On the return voyage the John R. Manning will sail via Kingman Reef and spend a week there in trolling operations to determine whether this type of fishing is as productive in the fall as it was found to be in the spring and early summer when the vessel previously operated at Kingman Reef. Bathythermograph observations will be taken throughout the trip, the tunas caught will be used in biological studies, and records will be kept of the fish caught by trolling throughout the trip. Weather observations will be radioed to the Navy and Weather Bureau four times daily.

"HENRY O'MALLEY" COMPLETES THREE-WEEK CRUISE IN HAWAIIAN WATERS (Cruise No. 3): The Henry O'Malley, one of the research vessels of the Pacific Oceanic Fishery Investigations, completed a three-week cruise in Hawaiian waters on June 8. The primary purpose of the cruise was to develop techniques for the use of mainland-type equipment in local skipjack (aku) fishing, and to gather information on the catching rate of this equipment for evaluation of exploratory fishing in new areas.

The baiting operations were not successful. Only 158 buckets of bait were taken during the entire cruise. Of the total, 100 buckets were mosquitofish taken in Pearl Harbor, and according to local fishermen, are poor bait for chumming up a school, although such bait is said to be quite valuable in holding a school once it is chummed to the boat. Much of the other bait taken was small in size and losses by fish passing through the overflow screen were experienced. Due to the lack of bait, only 10 schools were fished out of approximately 45 apparent schools sighted. Of the 10 schools fished, only two were chummed to the boat, and a total of 18 skipjack were taken. Local sampans baiting in the areas visited by the research vessel were also experiencing difficulties in obtaining sufficient bait to carry on their commercial operations.

All schools sighted and fished were small, fast, and erratic. The size of the vessel and its maneuverability made fishing these fast schools difficult. Local sampans were more successful in their fishing, but according to the captain of the sampan Olympic, they too were having difficulty in fishing the small, fast schools.

Secondary missions accomplished during the cruise were the taking of bathythermograph observations during the scouting for tuna; the collecting of biological specimens during night-lighting operations; the collecting of stomachs, gonads, morphometric data and vertebrae from pole-and-troll-caught fish.

The eruption of the volcano, Mauna Loa, on the island of Hawaii, while the vessel was in the vicinity, proved to be an excellent opportunity to augment the POFI fish collection which is used for reference in identifying contents of

tuna stomachs. The hot lava pouring into the sea caused large numbers of fish to die and come to the surface. One day was spent in collecting these fish from the waters adjacent to the lava flows.

"HENRY O'MALLEY" TO CONDUCT EXPLORATORY TUNA-FISHING OPERATIONS NEAR CANTON ISLAND: Primarily to conduct exploratory tuna-fishing operations near Canton Island and other islands of the Phoenix Group, the research vessel Henry O'Malley of the Service's Pacific Oceanic Fishery Investigations left Honolulu on July 1 for a 2½-month trip (Cruise No. 4). On this cruise to the Leeward and Phoenix Islands, the vessel will ascertain the abundance and availability of surface tuna schools, and the feasibility of employing live-bait fishing methods now in use on the mainland. Bait resources in the Phoenix Islands will be employed to determine the practicability of basing a fishery in that area using the bait which can be found locally.

The early part of the voyage will be concerned with examining the abundance of tuna bait fish at French Frigate Shoals, Lysan Island, Pearl and Hermes Reef, and Midway Island. If bait is available at any of these places, an attempt will be made to determine the feasibility of transporting and using it in tuna fishing in the Phoenix Group.

In the Phoenix Islands, the Henry O'Malley will work in conjunction with the other two PCFI vessels. The Henry O'Malley will work with the John R. Manning in attempting to hold tuna schools with live bait, while the latter vessel traps the fish with a purse seine.

In addition, the Hugh M. Smith will conduct oceanographical survey work, and will engage in flagline fishing near Canton Island for a limited time in mid-July.

"HUGH M. SMITH" SAILS TO COMPLETE COLLECTION OF MID-SUMMER HYDROGRAPHIC DATA (Cruise No. 5): In order to complete mid-summer hydrographic sections across the equatorial counter-equatorial current system to compare with similar sections taken in mid-winter on Cruise No. 2, the Hugh M. Smith sailed from Honolulu on June 16 on its fifth cruise. The vessel will operate in the vicinity of Pearl and Hermes Reef, Canton Island, and Jarvis Island, and is expected to return to Honolulu on August 9.

A series of hydrographic stations will be occupied. At each station plankton hauls also will be made, and determinations will be made of oxygen and dissolved nutrient materials. These data are being collected for determination of the position and extent of the counter-equatorial current, the degree of upwelling along the current boundaries, and the effect thereon on the productivity of the region, which is believed to be of fundamental importance to the tuna fisheries of the region.

Attempts will be made to catch live bait at French Frigate Shoals and Pearl and Hermes Reef. The bait caught will be transported to Canton Island for use by the Hugh M. Smith and the Henry O'Malley in fishing for tuna.

The Hugh M. Smith, one of the research vessels of the Service's Pacific Oceanic Fishery Investigations, will fish with long lines in the vicinity of Canton Island during the latter part of July, in addition to other incidental operations and observations.

FISHERY RESEARCH LABORATORY COMPLETED IN HONOLULU: In July, construction was completed on the fishery research laboratory in Honolulu, T. H., which will

house the research activities of the Service's Pacific Oceanic Fishery Investigations.

Occupying a site adjacent to the campus of the University of Hawaii, the new laboratory is the largest Federal laboratory of its kind outside the continental United States. To conform with typical Hawaiian architecture, the new building is of hollow concrete block construction, two stories high, and surrounds a court with lanais which face the court. Wings to provide additional space extend outward from the rear. The floor area, including lanais, is approximately 16,000 square feet.

Special scientific apparatus for conducting extensive biological and oceanographic research is now being installed in the laboratory, which will be formally dedicated with an "open house" in the fall when it has been fully equipped.

Laboratory research is supplementing or paralleling the exploratory investigations now being conducted at sea by the three vessels of the program--the Henry O'Malley, the Hugh M. Smith, and the John R. Manning.

Pacific Salmon Fisheries Commission

SOCKEYE FISHING IN OFFSHORE CONVENTION WATERS OF THE NORTH PACIFIC FOR 1950: Meeting June 19-20 in Washington, D. C., the International Pacific Salmon Fisheries Commission reaffirmed and clarified the action taken in Vancouver, B. C., on February 6 this year, regarding sockeye fishing by United States and Canadian fishermen in offshore convention waters of the North Pacific for the 1950 season, a Commission press release reported.

The Commission defined the period of closure of sockeye fishing in convention waters outside the Bonilla-Tatoosh line as being from July 1 through August 31. It was the Commission's view that its duties relating to the protection and rehabilitation of the Fraser River sockeye under the International Treaty did not require, for the 1950 season, any controls in these outside waters beyond August 31.

At its February meeting in Vancouver, B. C., the Commission considered and discussed with its Advisory Committee the need for controlling sockeye fishing in these offshore convention waters in order to fulfill the Treaty requirements. These considerations included the following:

1. The Commission's two primary responsibilities under the Treaty are (a) to assure rehabilitation and maximum production consistent with conservation and (b) to obtain equal division of the catch between the two countries.

2. The Commission has carefully worked out methods for determining the catch escapement ratios in relation to increased efficiency of gear and increased intensity of the fishery. These methods must be followed in order to receive a proper escapement to the spawning grounds. Previous years have shown beyond question that substantial catches of sockeye salmon can be made in outside waters, but it does not seem possible, at least with present methods, to interpret the effect of such catches with any degree of accuracy. Hence the entire escapement schedule of the Commission would be imperiled if these offshore catches are allowed at this time.

3. The fishing fleets of both countries have now demonstrated that they are fully capable of taking more than the entire allowable catch of sockeye in inside waters alone.

4. Identification of the various races of sockeye is not possible in the offshore area and scientific control of the catch-escapement ratios would require reduced catch allowances to guarantee sufficient escapement. The Commission is endeavoring to allow maximum utilization on a sustained yield basis and this could not be done with the offshore operation.

South Pacific Fishery Investigations

PILCHARD SPAWNING MORE INTENSE OFF LOWER CALIFORNIA IN APRIL: Examination has been completed of plankton collections from the April cruises of the three vessels working on the cooperative Pacific sardine research program being conducted by the Service's South Pacific Fishery Investigations in cooperation with the Scripps Institution of Oceanography, the California Division of Fish and Game, and the California Academy of Sciences.

These data indicate that pilchard spawning, much more intense in April than in March, was in the area between Cedros Island and Pt. Abreojes off Baja California. However, spawning extended farther north in April than in March, reaching a point off Santa Monica in southern California. The distribution of pilchard larvae in April was similar to the distribution of eggs, but extended only as far north as San Diego.

The distribution of anchovy larvae was similar to the distribution of pilchard eggs.

April collections contained 11,519 fish larvae, including 30 or 40 species. Besides pilchards and anchovies, there were large numbers of jack mackerel, hake, saury, lantern fish, and other lesser-known species.

The three vessels have completed their June cruises.

Service Conducts Fish-Cooking Demonstrations for California Institutions

A concerted bid to encourage the greater use of fish in the institutional market was made by the U. S. Fish and Wildlife Service during the months of April and May 1950.

In a series of demonstrations, professional fish-cookery methods were shown at 11 California State hospitals, prisons, and homes, representing 35,000,000 hot meals annually. The demonstrations, arranged through the cooperation of the California Department of Corrections, Youth Authority, and Department of Mental Hygiene, were conducted at the following points:

Veterans Home of California - Yountville	Agnews State Hospital - Agnew
Stockton State Hospital - Stockton	Modesto State Hospital - Modesto

Preston School of Industry - Waterman	Norwalk State Hospital - Norwalk
Calif. School for the Deaf - Berkeley	Patton State Hospital - Patton
Camarillo State Hospital - Camarillo	Pacific Colony - Spadra
Nelles School for Boys - Whittier	

These institutions were visited in a three-week field tour in April by a home economist and a fishery marketing specialist of the Service's staff. Coverage included considerably more than these 11 units, as other nearby institutions (San Quentin and Folsom Prisons, Langley-Porter Clinic of San Francisco, the California School for the Blind, Pine Grove Camp, and Fricot Ranch School) sent representatives to the demonstrations. The units covered represented three-fourths of California's 48,000 institutional patients and inmates. A visit was made also to the Napa Hospital. Service-prepared fish cookery pamphlets were left for units not represented.

The Home Economist from the Service's Seattle Laboratory conducted the demonstration of five recipes considered most adaptable to use in the institutions: A fish loaf, using canned salmon; baked fillets cooked with lemon juice and chopped onion; baked fillets in tomato sauce; breaded baked fillets; and tuna salad. Cooks and nutritionists present also were shown how to make a lamaze sauce for use with the loaf and the salad.

The groups were told about the types and forms of fishery products available, how to tell if fish is in good condition, and how to care for fish prior to cooking. Many questions were answered during the demonstrations and afterwards while the audiences were tasting the prepared dishes.

Because most of the institutions participating prepare such a large number of meals, they are necessarily limited in the variety of ways they can cook and serve fish. Much of their fish, also, must be free from bones. Some of the larger institutions have only large steam-jacketed kettles to use in cooking fish stews and chowders for the patients, but rotary ovens which are used for preparing baked dishes are also available in others. The State of California is remodeling the kitchens of many of the institutions and will soon have rotary ovens for all large-scale operations. During several of the demonstrations, the fish loaf and fillets were baked in these rotary ovens with excellent results.

The recommended recipes were received enthusiastically by the institution staffs. Cooks tasted the dishes studiously and almost invariably selected one as "the one I will try next time we serve fish." Most demonstrations were held in kitchens with all kitchen staff members present.

From the reaction of the audiences, results are expected to be as good as those of a demonstration given last November at the Los Angeles Veterans Administration Center. Two recipes shown at that point, which proved popular among the Center's patients, have since been recommended for use in all the VA's western installations.

California's penal, mental, and youth institutions serve about 35 million hot meals a year (not including breakfasts). In some institutions considerable fish is used. In the Youth Authority, for instance, where the use of foods and planning of menus are closely supervised, the total is about 24 pounds per year per person, figured in marketed products.

In the mental hospitals, consumption of fish is lower, with meal planning left largely to the discretion of the local food supervisors. Fish in some form was being served about once a week in such institutions.

During the course of the demonstrations and in a special visit with the State purchasing officer, procurement problems were discussed. All fish used are purchased by the institutions under competitive contract. The institutions were fairly well satisfied with the fish being received, but they expressed a need for quality safeguards that would permit them to place more reliance on supplies of fresh and frozen fish. Most institutions felt that they had to be "hardboiled" in returning fresh or frozen fish of questionable quality if they were to receive good supplies consistently. As almost all of the institutions are located several hours to a day's trip from the suppliers, return of these supplies means an inconvenient last-minute change in menu.

The State purchasing office recognized that better quality safeguards are desirable and expressed a desire for fresh or frozen fish specifications that might help to insure delivery of satisfactory supplies. A need for institution-sized cans of sardines and salmon was also emphasized. Each use of these products now requires the opening of several hundred small cans.

The Service's program will be continued during the balance of 1950 and in 1951, covering schools, and public and private institutions.

--Clarence R. Lucas, Fishery Marketing Specialist,
Branch of Commercial Fisheries.

U.S. Army Needs Fishery Personnel

The Department of the Army needs certain qualified civilian employees. There are presently a number of openings for Fishing Area Inspectors for duty in Japan for a period of 24 months.

EDUCATION AND EXPERIENCE: Applicant must be a duly licensed Ship's Officer (Captain or First Mate) or have the Naval equivalent thereof with thorough knowledge and experience in navigation. He must have had experience at sea on small vessels (less than 1,000 gross tons), preferably fishing vessels.

QUALIFICATIONS: Applicant should be between the ages of 21 and 50 years, in good health, and with physical endurance to be able to withstand rigors of constant 30-to 50-day inspection on small Japanese fishery inspection vessels. Desirable but not essential qualifications are a knowledge of radio-telegraphy, experience in dealing with Orientals, experience in patrol work and law enforcement at sea.

This position pays an annual salary of $4,600. Housing is provided the employee without cost, and meals are procured at approximately $35 to $40 per month. Dependent housing is not authorized for this position.

Applicants should apply to: E. J. Henning, Representative, Overseas Affairs Branch, Civilian Personnel Division, Department of the Army, 139 Centre Street, New York 13, N. Y.

U. S. Firm Planning to Operate Whaling Fleet[1/]

A United States firm, with offices in New York City, is planning to operate a whaling fleet for the first time in more than a decade. Since the middle of December, negotiations have been held between the United States firm and a German firm in Hamburg on the operation of a whaling fleet for the benefit of Germany, a January 18 American consular dispatch from Hamburg reports.

The mothership of the whaling fleet, formerly the T-2 tanker Herman F. Whiton, is undergoing conversion in Kiel, Germany. With a crew up to 325, the vessel is scheduled to have a capacity to process 4,000 whales rendering 25,000 tons of oil. In addition, 10 corvettes are being converted to "killer" boats. The fleet should be ready for the next whaling season, which commences in December.

1/ Also see p.44 of this issue.

U. S. Pack of Canned Alewives, 1949

The 1949 pack of canned alewives totaled 111,994 standard cases, valued at $469,398 to the canner (Table 1)--a decline of 9 percent in quantity and 27 percent in value as compared with the previous year. Although the pack was the

Table 1 - Pack of Canned Alewives by States, 1949
(Quantity in Standard Cases[1/] and Value to the Canners)

State	Quantity	Total Value	Avg. Price Per Std. Case
	Std. Cases[1/]	$	$
Maryland	67,828	295,021	4.35
Virginia	44,166	174,377	3.95
Total	111,994	469,398	4.19

1/"Standard cases" represent cases of various sizes converted to the equivalent of 48 cans of 15 ounces each per case.

smallest since 1943, it was greater than for any year prior to 1943 (Table 2). The biggest decline occurred in the Maryland pack. Practically the entire pack was canned in 15-ounce cans. Alewives were canned in 7 plants in Maryland and 9 plants in Virginia.

Table 2 - Pack of Canned Alewives, 1940-49
(Quantity in Standard Cases[1/] and Value to the Canners)

Year	Quantity	Total Value	Avg. Price Per Std. Case	Year	Quantity	Total Value	Avg. Price Per Std. Case
	Std. Cases	$	$		Std. Cases	$	$
1949 ..	111,994	469,398	4.19	1944 ..	135,995	793,254	5.83
1948 ..	123,134	639,356	5.19	1943 ..	112,472	619,213	5.51
1947 ..	139,816	779,150	5.57	1942 ..	77,232	399,555	5.17
1946 ..	193,980	1,180,197	6.08	1941 ..	42,156	153,269	3.64
1945 ..	131,062	753,769	5.75	1940 ..	24,486	72,070	2.94

1/"Standard cases" represent cases of various sizes converted to the equivalent of 48 cans of 15 ounces each per case.

Canners received an average of $4.19 per standard case for the 1949 pack, compared with $5.19 in 1948, $5.57 in 1947, and $6.08 in 1946.

U. S. Production of Menhaden Products, 1949 (Revised)*

Additional data, which became available after the June issue of the Review was published, indicates that actual receipts of menhaden by manufacturers of menhaden products in 1949 amounted to 1,072,630,265 pounds (1,600,940,694 fish). This was larger than the previously published figures.

Table 1 - Manufacturers' Receipts of Menhaden and Production of Menhaden Products, 1949 1/
(Quantity and Value to the Manufacturer)

States	Menhaden Utilized	Products Manufactured				
		Dry Scrap and Meal		Oil		Total
	Pounds	Tons	Value ($)	Gallons	Value ($)	Value ($)
New Jersey	157,582,459	16,620	2,549,391	1,570,065	714,605	3,263,996
New York and Delaware	249,684,210	2/25,303	2/3,763,875	2,428,176	1,100,000	4,863,875
Virginia	126,430,336	15,100	2,417,735	739,442	292,971	2,710,706
North Carolina	227,679,400	2/23,016	2/3,421,841	751,687	259,901	3,681,742
Florida	54,919,900	6,070	1,006,765	259,834	93,262	1,100,027
Mississippi, South Carolina, Louisiana, and Texas	256,333,960	27,284	4,653,732	2,544,707	946,771	5,600,503
Total	3/1,072,630,265	113,393	17,813,339	8,293,911	3,407,510	21,220,849

1/Does not include the production of menhaden condensed solubles. Revised.
2/A small production of acidulated scrap has been included with the production of dry scrap and meal.
3/1,600,940,694 fish.

CORRECTION: In the last paragraph of the article "Manufacture of Meal and Oil Utilizes Half of the Fisheries Catch" on p. 24 of the June 1950 Commercial Fisheries Review, the menhaden catch in 1949 was actually 1,073 million pounds instead of the quantity shown.

*Revises the 1949 statistics as published in Commercial Fisheries Review, June 1950, pp. 26-7.

Wholesale and Retail Prices

WHOLESALE PRICES, MAY 1950: Wholesale prices of edible fishery products during May were only 1.0 percent lower than the previous month, but 6.3 percent below May 1949, according to the Bureau of Labor Statistics of the Department of Labor. The fish and shellfish (fresh, frozen, and canned) wholesale index for May was 94.5 percent of the 1947 average (Table 1).

Prices of fresh and frozen fishery products during May were 1.4 percent below April this year, but 11.1 percent higher than in May 1949.

Although the drawn, dressed, or whole finfish subgroup index during May was only 1.1 percent below April, there were substantial price declines among the fresh-water and fresh halibut items which make up this subgroup. The decline in the prices of fresh lake trout, whitefish, and yellow pike followed the general seasonal trend which takes place during May in the fresh-water fisheries because of increased production in the Great Lakes. With the opening of the Pacific Coast halibut season on May 1, fresh halibut prices were slightly lower than the prices for frozen halibut during April when cold-storage stocks of this item had reached a very low point. To compensate for all price declines in this subgroup, fresh king salmon prices rose during May, while fresh drawn haddock prices remained steady at the April level. Prices for drawn, dressed, or whole finfish in May this year were still 12.9 percent higher than in May 1949. Except for lower prices quoted on whitefish and yellow pike in New York City, May 1950 prices for all other items in this subgroup were higher than May 1949 prices.

Table 1 - Wholesale Average Prices and Indexes of Fish and Shellfish, May 1950, with Comparative Data

GROUP, SUBGROUP, AND ITEM SPECIFICATION	POINT OF PRICING	UNIT	AVERAGE PRICES ($)			INDEXES (1947 = 100)		
			May 1950	Apr. 1950	May 1949	May 1950	Apr. 1950	May 1949
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)						94.5	95.5	100.9
Fresh and Frozen Fishery Products:						99.1	100.5	99.0
Drawn, Dressed, or Whole Finfish:						104.8	106.0	98.8
Haddock, large offshore, drawn, fresh	Boston	lb.	.09	.09	.07	97.2	95.0	73.2
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	New York City	"	.33	.35	.32	97.2	103.2	92.5
Salmon, king, lge. & med., dressed, fresh or frozen	" " "	"	.52	.46	.50	126.3	112.2	123.2
Lake trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	"	.46	.69	.42	101.5	151.9	91.1
Whitefish, mostly Lake Superior, drawn (dressed), fresh	"	"	.41	.58	.38	119.1	168.5	110.4
Whitefish, mostly Lake Erie pound net, round, fresh	New York City	"	.50	.63	.52	113.9	141.5	117.1
Yellow pike, mostly Michigan (Lakes Michigan & Huron), round, fresh	" " "	"	.29	.38	.31	67.7	88.4	72.5
Processed, Fresh (Fish and Shellfish):						89.4	91.9	81.7
Fillets, haddock, small, skins on, 20-lb. tins	Boston	lb.	.29	.30	.25	104.7	106.4	89.1
Shrimp, lge. (26-30 count), headless, fresh or frozen	New York City	"	.62	.64	.54	88.9	92.9	77.9
Oysters, shucked, standards	Norfolk area	gal.	3.50	3.50	3.50	86.2	86.2	86.2
Processed, Frozen (Fish and Shellfish):						103.4	102.5	93.9
Fillets: Flounder (yellowtail), skinless, 10-lb. boxes	Boston	lb.	.35	.40	.24	113.0	127.5	75.9
Haddock, small, 10-lb. cello-pack	"	"	.26	.26	.20	118.8	116.2	91.9
Rosefish, 10-lb. cello-pack	Gloucester	"	.20	.20	.21	98.2	101.0	106.5
Shrimp, lge. (26-30 count), 5- to 10-lb.bxs.	Chicago	"	.68	.64	.64	98.4	92.9	92.6
Canned Fishery Products:						87.6	88.0	119.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans per case	Seattle	case	14.58	14.53	22.66	95.0	94.7	147.7
Tuna, light meat, solid pack, No. ½ tuna (7 oz.), 48 cans per case	Los Angeles	"	14.25	14.25	16.15	92.7	92.7	105.1
Sardines (Pilchards), California, tomato pack, No. 1 oval (15 oz.), 48 cans per case	" "	"	5.50	5.50	7.50	61.5	61.5	83.9
Sardines, Maine, keyless oil, No. ¼ drawn (3¼ oz.), 100 cans per case	New York City	"	7.00	7.38	8.75	68.6	72.3	85.8

A substantial drop in fresh headless shrimp prices during the month, because of the usual seasonal increase in production, was responsible for the decline of 2.7 percent in the processed fishery products index as compared with April. However, this subgroup index was still 9.4 percent higher than for May the previous year. In May this year, shrimp prices were 14.1 percent higher and fresh haddock fillet prices 17.5 percent higher than in May 1949.

Frozen processed fishery products prices during May were 0.9 percent higher than April and 10.1 percent higher than in May a year ago. Price increases in frozen haddock fillets and frozen shrimp were offset by declines in frozen flounder and rosefish fillets.

The May index for canned fish was 87.6 percent of the 1947 average--0.5 percent lower than April and 26.4 percent below May 1949. Lower prices quoted for canned Maine sardines were mainly responsible for the decline in this subgroup. Canned pink salmon prices increased slightly during May, while prices of canned tuna and California sardines remained at the same level as in April this year.

RETAIL PRICES: Between April 15 and May 15 this year, retail food prices on the average continued to rise. The retail food price index on May 15 was 200.3 percent of the 1935-39 average, 3.3 percent higher than on April 15, but 1 percent lower than a year earlier (see Table 2).

For all fish and shellfish (fresh, frozen, and canned), the retail index on May 15 was 293.2 percent of the 1935-39 average, 1.4 percent below April 15 and 7 percent lower than on May 15, 1949.

Table 2 - Retail Price Indexes for Foods and Fishery Products, May 15, 1950, with Comparative Data

Item	Base	Indexes		
		May 15,1950	Apr.15,1950	May 15,1949
All foods	1935-39 = 100	200.3	196.6	202.4
All fish and shellfish (fresh, frozen, and canned)	do	293.2	297.4	315.4
Fresh and frozen fish	1938-39 = 100	270.6	276.0	254.5
Canned salmon (pink)	do	327.8	328.2	458.4

From mid-April to mid-May, retail prices for fresh and frozen fishery products only dropped 2 percent; however, on May 15 they were 6.3 percent higher than in mid-May 1949. Prices of canned pink salmon in mid-May this year were only slightly below the previous month, but were still 28.5 percent lower than on May 15, 1949.

RETAIL PRICES FOR CERTAIN FISHERY PRODUCTS: The retail prices shown in Tables 1 and 2 were collected by the Department of Labor's Bureau of Labor Statistics on March 15, 1950, as supplemental prices to be used in the revision of the Consumers' Price Index.

Table 1 - Retail Prices of Canned Tuna, California Sardines, Shrimp, and Pink Salmon in Ten Cities, on March 15, 1950

City	Canned Tuna (Fancy Solid Pack, light meat, 7-oz. can)		Canned Sardines, Calif. (In Tomato Sauce, 15-oz. can)		Canned Shrimp, (Wet-Packed, whole, 5-oz. can)		Canned Pink Salmon 1/ (No. 1 Tall, 16-oz. can)	
	Average Price	Range of Prices	Average Price	Range of Prices	Average Price	Range of Prices	Average Price	Range of Prices
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Butte	45.2	39 - 50	23.1	19 - 29	50.8	43 - 55	46.2	43 - 53
Cedar Rapids	38.1	29 - 53	22.4	15 - 35	48.5	39 - 65	44.1	35 - 59
Chicago	40.1	25 - 52	22.0	12 - 50	44.3	35 - 75	42.7	34 - 69
Dallas	44.8	37 - 59	21.9	15 - 35	47.4	43 - 59	41.0	35 - 59
Denver	42.9	39 - 50	20.4	17 - 28	50.1	46 - 69	43.5	37 - 63
Jacksonville	41.7	34 - 49	22.3	20 - 29	46.4	41 - 55	43.7	39 - 59
Providence	34.9	29 - 49	21.5	17 - 31	43.6	34 - 69	40.6	35 - 59
San Francisco 2/	42.2	36 - 49	20.7	15 - 32	47.6	42 - 58	49.9	40 - 63
Scranton	42.3	33 - 49	21.5	15 - 31	48.9	41 - 69	43.9	35 - 65
Washington	41.6	37 - 53	21.6	17 - 33	45.9	39 - 63	42.6	35 - 59

1/The only one of the group collected regularly on the 15th of each month and which has been included in the retail food price index.
2/Based on incomplete sample of price quotations. Not directly comparable with prices for previous months.

Table 2 - Retail Prices of Frozen Rosefish (Ocean Perch) and Haddock Fillets in 56 Cities, on March 15, 1950

City	Frozen Rosefish (Ocean Perch) Fillet (Prepackaged, 1 lb.)		Frozen Haddock Fillet (Prepackaged, 1 lb.)		City	Frozen Rosefish (Ocean Perch) Fillet (Prepackaged, 1 lb.)		Frozen Haddock Fillet (Prepackaged, 1 lb.)	
	Average Price	Range of Prices	Average Price	Range of Prices		Average Price	Range of Prices	Average Price	Range of Prices
	Cents	Cents	Cents	Cents		Cents	Cents	Cents	Cents
United States	40.4	25 - 79	49.0	33 - 79	Milwaukee	36.1	29 - 43	50.5	39 - 63
Atlanta	39.5	33 - 49	51.1	43 - 59	Minneapolis	36.7	29 - 48	50.8	35 - 62
Baltimore	40.9	35 - 49	49.8	39 - 65	Mobile	38.8	34 - 44	46.4	44 - 58
Birmingham	33.4	29 - 39	42.8	35 - 48	Newark	39.1	35 - 41	50.1	39 - 56
Boston	38.8	35 - 45	46.3	39 - 55	New Haven	40.1	35 - 50	48.4	45 - 55
Bridgeport	37.5	34 - 39	48.6	43 - 54	New Orleans	46.9	39 - 61	55.8	41 - 65
Buffalo	38.0	31 - 49	44.3	35 - 55	New York	39.0	35 - 49	47.6	39 - 69
Butte	49.2	47 - 55	55.3	49 - 59	Norfolk	37.9	33 - 49	46.5	43 - 59
Cedar Rapids	40.4	36 - 45	49.2	45 - 55	Omaha	39.1	33 - 49	46.8	39 - 59
Charleston, S.C.	38.9	33 - 45	47.4	35 - 55	Peoria	43.5	35 - 59	48.3	39 - 59
Chicago	40.8	29 - 70	49.8	39 - 71	Philadelphia	39.1	32 - 49	48.3	39 - 65
Cincinnati	38.3	32 - 54	47.7	39 - 65	Pittsburgh	38.7	31 - 49	44.1	37 - 53
Cleveland	42.5	33 - 79	49.1	39 - 79	Portland, Me.	37.7	35 - 39	51.7	45 - 55
Columbus	38.0	32 - 55	45.6	39 - 55	Portland, Oreg.	2/	2/	2/	2/
Dallas	41.6	33 - 57	49.1	43 - 59	Providence	41.5	35 - 55	47.5	39 - 59
Denver	41.9	35 - 60	49.8	42 - 63	Richmond	40.0	33 - 47	49.0	43 - 53
Detroit	39.5	29 - 49	49.4	39 - 59	Rochester	37.6	31 - 49	43.1	35 - 55
Fall River	36.0	35 - 40	46.0	39 - 57	St. Louis	41.0	35 - 53	48.1	39 - 56
Houston	40.4	25 - 59	55.7	45 - 67	St. Paul	35.1	29 - 49	51.2	43 - 69
Indianapolis	40.8	35 - 59	47.0	35 - 59	Salt Lake City	50.9	43 - 69	55.3	45 - 73
Jackson	45.7	39 - 55	57.0	55 - 59	San Francisco	50.5	41 - 60	56.9	41 - 69
Jacksonville	39.4	33 - 49	51.1	43 - 60	Savannah	39.0	33 - 49	46.7	43 - 49
Kansas City	38.4	35 - 49	44.8	39 - 59	Scranton	40.2	37 - 53	49.5	39 - 65
Knoxville	36.9	33 - 39	43.4	35 - 49	Seattle	52.2	49 - 58	59.0	57 - 61
Little Rock	2/	2/ 2/	2/	2/ 2/	Springfield, Ill.	42.1	28 - 55	46.9	39 - 59
Los Angeles	46.6	39 - 59	54.8	43 - 69	Washington, D.C.	40.2	33 - 59	47.1	41 - 59
Louisville	34.8	29 - 45	42.6	36 - 53	Wichita	42.8	33 - 59	55.4	45 - 75
Manchester	39.8	35 - 45	45.8	39 - 53	Winston-Salem	42.2	33 - 50	48.6	39 - 59
Memphis	47.6	44 - 55	50.9	45 - 59					

1/Based on incomplete sample of price quotations. Not directly comparable with prices for previous months.
2/Insufficient number of quotations to obtain reliable average price or price range.

Brazil

FISHERMEN ORGANIZED IN COLONIES: Brazilian law requires that fishermen belong to colonies which must have a minimum of 150 members, according to a June 26 American embassy report from Rio de Janeiro.

The colonies levy a 3 percent tax on the catch out of which are provided certain services, including education, medical care, and loans for financing the purchase of boats and gear. There are 22 such colonies in the Federal District of Brazil.

In addition to belonging to colonies, fishermen may form cooperatives. The Director of the Fish Section indicated that the cooperative movement was making little headway among fishermen, presumably because the colonies provide a number of services normally provided by cooperatives.

Canada

FISH-PROCESSING INDUSTRY: Current employment in the Canadian fish-processing industry is estimated at about 5,500, according to a report from the Economic and Research Branch of the Canadian Department of Labor transmitted by the American Embassy at Ottawa on June 21.

This is, of course, an extremely seasonal industry, and the plants are only now preparing for their active seasons. From the experience of previous postwar years, it is estimated that the peak employment in this industry (which occurs during the late summer or fall) this year may be about 12,000. A great many of these additional workers will be casual employees, including Indians and part-time fishermen. With the uncertainty of European markets, to which a substantial portion of Canadian fish products have been shipped, there appears to be a greater seasonal variation in employment in this industry. In 1947, there was a difference of about 70 percent between trough and peak employment indexes on a June 1, 1941, base, while in 1949 the difference had increased to about 88 percent.

Records indicate that only a few (700 to 900) of the workers in the industry may be organized as fish processors or handlers. A great many may be organized as fishermen, while in Newfoundland a substantial number belong to unions of loggers. Of the unions of fish handlers, of which a record is available, most are independent, although some have only recently severed their affiliation with the Canadian Congress of Labour and one transferred its affiliations from the C.C.L. to the Trades and Labour Congress.

* * * * *

APPROVES INTERNATIONAL NORTHWEST ATLANTIC FISHERIES CONVENTION:[1/] Canada signified readiness to cooperate with nine other countries in the development and protection of the fishery resources of the northwest Atlantic when Parliament on June 1 approved the International Northwest Atlantic Fisheries Convention, the Canadian Fisheries Department Trade News of May 1950 announced.

To be brought into force, the treaty had to be ratified by any four signatory governments. Such action already has been taken by Great Britain, Iceland, and the United States, and therefore, deposit of the Canadian instrument of ratification at Washington, D. C., makes the treaty effective. Ratification of the treaty by Canada extends to Newfoundland which entered Confederation since the signing ceremony took place.

1/ See Commercial Fisheries Review, November 1949, pp. 71-2; March 1949, pp. 73-82; December 1948, pp. 65-74.

Chile

FISHERY EDUCATION: The University of Chile may start a fishing school early in 1951, reports the American Embassy at Santiago in a dispatch dated June 9. It is proposed that youth of university age, who have graduated from the secondary schools of the nation, will be taken and trained to become fishing experts and engineers. There is, according to reports, an increasing interest in developing Chile's fishing industry.

There is at present in San Vicente near Talcahuano, a fishing school for primary-age children, most of them sons of fishermen in the region. In Miramar, a suburb of Valparaiso, there is also a marine biological institute connected with the University of Chile.

Denmark

DANISH INVESTIGATIONS ON CONTINENTAL SHELF JURISDICTION: A Danish Governmental committee has been studying the problem of jurisdiction over the continental shelf. The work of the committee has progressed slowly, according to an April 1 report from the American Embassy at Copenhagen. The purpose of the study is to determine whether Denmark should proclaim jurisdiction over the far-reaching continental shelf around the whole of Greenland and around the Faeroe Islands.

On January 20, 1950, Minister Georg Cohn, chairman of the Danish governmental committee, delivered a lecture over the Danish State Radio on the problem of jurisdiction over the continental shelf. In view of his position as Foreign Office adviser in matters related to international law, and his particular assignment as committee chairman, his remarks may be considered an official expression of the Danish Government.

In his lecture, Georg Cohn defends in general terms the extension of maritime jurisdiction considerably beyond the traditional limits as far as fishery rights are concerned.

The following excerpts from this lecture may be of interest in view of today's importance of the problem of jurisdiction over the continental shelf and the extension of territorial waters:

With reference to jurisdiction over a certain water area off the coasts, the speaker pointed out that originally "The State claimed jurisdiction over a certain water area off its coasts, but had only the water surface, and not the sea bottom in mind."

In addition, he declares that the scope of territorial waters even today remains an object of dispute. Denmark and Great Britain, for example, fix it at 3 miles, Norway and Sweden at 4 miles, and Russia at 12 miles, within which they maintain exclusive rights for fisheries, police inspection, etc. Also the character of the jurisdiction was highly disputed (originally), but in modern times it is generally accepted that there is question about real ownership. From this the conclusion was drawn that the jurisdiction applies also, as it does in the terrestrial territory, to the atmosphere overhead and the subsoil below the maritime territory. It was a purely mathematical or geographical calculation of distance which did not consider the detailed quality of the sea bottom, or the character of the water, whether flat sea or real ocean. The continental shelf, therefore, in most places extends much, much farther than does the maritime territory.

"The efforts of most recent times to obtain recognition of jurisdiction upon this far-reaching continental shelf off the coast originated from a quite different starting point and, in principle, has nothing to do with the maritime territory. Originally it was a question only about the title to the sea bottom, not to the water above it. Later developments have shown, however, that the two issues cannot be kept completely separated.

"The continental shelf and the flat sea above it are essentially different from the deep sea not only geologically and geographically, but also economically. All fisheries, which are such an important part of the world's nourishment, take place, with very few exceptions, within the flat sea, while the deep sea is comparatively barren of fish which are important for human nourishment.

"Also, borings for oil or other mineral occurrences can be performed on the shelf sea bottom just as well as in the terrestrial territory, and already are performed to a very large extent, while, so far, the greater depths are unaccessible for human enterprise. Finally, the vegetation, the vitamin contents of which contribute so much to the nourishment of the fish population and thus, indirectly, also to human nourishment, exists only in the flat sea, where the sun has a chance to affect vegetation...

"It is believed that newly discovered oil fields under the sea bottom of the Continental Shelf in the Mexican Bay will more than double the oil reserves of America. Similar occurrences are expected in submarine oil fields off the coasts of Louisiana, Texas, and Mississippi. It is obvious that the values at stake in this connection necessitate a decision as to ownership of these resources, and that a State will hardly be able to permit a foreign country to establish itself on the continental shelf off its territory, but must reserve the first priority on the natural riches for itself and its nationals.

"Considerations of a somewhat different kind assert themselves with regard to fisheries. Here the interest is about two different matters. The one is a national-egotistic interest in reserving for its own nationals, who perhaps to an outstanding extent have to rely upon fisheries for their nourishment, a certain exclusive right or preference to the fisheries; and the other is a more general world economic interest in the protection of fish occurrences against exhausting management (overfishing). For these purposes the hitherto recognized extent of a maritime jurisdiction of 3 miles is far from sufficient. Many areas which formerly were rich in fish, now are nearly barren, due to overfishing. But protection rules which can only be maintained within a distance of 3 miles off the coast are no remedy. On the contrary, it has been thought that a recovery of the fish population might be possible if inspection and protection regulations could be carried through for more extensive areas of the flat sea.

"Finally, concerning the cultivation of the sea bottom of the Continental Shelf, only a few experiments have been made so far in places which are protected against rough sea. It should, however, be possible in such places, by the use of fertilizers, to increase production of crustacea and other organisms which can become highly important for the human nourishment...

"Certain doubts, however, assert themselves against an extension of jurisdiction of the State over the continental shelf, which expansion must be the consequence of the facts I just mentioned. There is question of serious curtailment of that 'Freedom of the Seas' which hitherto has been approved in International Law, and that exactly in the fields which are most important for shipping and fisheries. The fishermen of most countries do not content themselves with fishing in the flat sea off the coasts of their own country, but proceed to other areas where fisheries are most remunerative. Control and protection laws in such areas may very well limit their former freedom considerably, and also for the shipping trade limiting consequences may be anticipated. The world shrinks when the free international area is limited, and national supremacy is extended. This contradicts the efforts which otherwise have been made in modern time with a view of procuring the highest possible degree of freedom for all nations to participate in and develop the world's food supply. Some consideration has been given this viewpoint in the proclamations issued by the various States, but the general trend to damage international economy will, nevertheless, persist.

"The entire question is of a recent date and was brought up by the proclamations of The United States of September 28, 1945. The proclamations established a distinction between the sea bottom of the continental shelf which simply was made subject to State jurisdiction, and the establishment of fishery zones in the sea off the coasts where certain protection regulations, eventually in cooperation with other interested countries, might be introduced. But the character of the water area as open sea should be maintained, and particularly should the rights of other countries to free navigation in these areas not be curtailed. However, some American States very soon followed with more far-reaching claims. Under these claims, jurisdiction included not only the sea bottom itself and its mineral occurrences, but also the water areas beyond it (i.e., the entire flat sea) and the atmosphere. In reality this was an enormous expansion of the maritime jurisdiction to a hitherto completely unknown extent. This applies to the declarations of Mexico and Argentina, in 1945 and 1946, respectively. But this is not everything: On the west coast of South America where the Shelf, as I have already mentioned, is rather narrow, so that jurisdiction over it would not result in any farther expansion of claim than to the present maritime territory, Chile in a proclamation of 1947 quite simply claimed the total waters within a line 200 miles off, and parallel to, the coast. A similar zone is claimed also off all coasts of the insular possessions of Chile, including such points as Juan Formandez which is about 400 British miles distant from the mainland and Easter Island, which is more than 2,000 British miles away. Thus, there are enormous areas which in these districts are far outside the continental shelf, and have no relation whatsoever to the more recent theories of continental shelf jurisdiction. Something similar is true for the declaration of Peru of 1947, and of Costa Rica of 1948. Other States which have made more or less far-reaching claims to an expansion of their jurisdiction, are Great Britain (only, however, in limited areas), Nicaragua, Iceland (Law of April 5, 1948), and Saudi Arabia in a 1947-issued proclamation reserving the right to fix the exact boundaries by agreement with other countries.

"All this will show that most of these expansions of the jurisdiction of the States have taken place in the form of unilateral proclamations, and it therefore is very natural to ask: Are they really legal, and must they be respected by other States?. Former free admission to all parts of the open sea is considerably curtailed by these actions.

"In cases like those of Chile and Peru, and others, where irrespective of the bottom conditions, an enormous expansion of the maritime jurisdiction is carried through by a simple stroke of the pen, it can safely be maintained that protests will be made...On the other hand, where the expansion relates to a clearly defined continental shelf, it must be a consequence of developments during the most recent times that the other States have not protested against such expansion of jurisdiction, and thus silently have approved it; this means that other countries must also be entitled to take similar steps.

"In my opinion, it thus should be possible to proclaim today, without any further formalities, Danish jurisdiction on the far-reaching continental shelf around the whole of Greenland and around the Faroe Islands. It is somewhat more difficult with regard to the Danish parent country and Bornholm...These areas, together with the whole of Great Britain, the North Sea coast of France, Belgium, Holland, Sweden, and all the Baltic States are located within a flat sea where there cannot be said to be any shelf edge which borders on the deep sea. Only between Denmark and Norway is there a deep channel, where from the Danish side a claim could be raised to a range of continental shelf. In relation to the other countries, a division of the joint shelf - on which all these countries can be considered based—must be established. Such division is a natural claim in order to procure clear lines in the

future utilization of the natural occurrences in the subsoil, with regard to protection regulations for the fisheries, etc. The geographical or mathematical lines to be used as basis for such a division are dubious...The definite solution will, I believe, depend on negotiations and agreements among the various adjacent countries, and that can very well cause certain difficulties.

"Finally, you could imagine the entire question solved by a large international conference in which all States were represented, and where the final decision should be reached in these important problems which really are of major interest for all of them. The countries I have already mentioned, and which have issued declarations of their own, and a number of other countries where similar declarations are under preparation, apparently do not wish to abide by such an international solution. It will be extremely difficult to establish general rules because conditions, both geographic and economic, are very different in the various parts of the world. Countries off the coasts of which there is only a very narrow shelf will scarcely be content, for example, with regard to their fisheries, when simultaneously other countries with a wide flat sea take possession of enormous areas of the open sea and reserve them for the enterprise of their own nationals.

"In 1930 an attempt was made to solve, by way of an international conference, the comparatively much less complex question of the extension of the maritime jurisdiction, a field in which precedents could also be found in old established rules. It proved however, at that time, that conflicting interests among the States were so great that nothing could be settled, and the conference ended without results. This is likely to be true to a still higher extent if an international conference now is called for the completely new and unexplored field of jurisdiction over the continental shelf. It therefore is likely that it will be necessary for the individual countries who are interested therein to make their own arrangements, eventually through negotiation with their nearest neighbors, an arrangement which shall be in accord with the trend so clearly expressed in the proclamations already issued by a number of States, and which have found approval in international public opinion.

"In Denmark the Government established, in December, 1948, a committee for consideration and study of all these problems. The committee has already collected a lot of material which will be published in its report. When the report is completed, the Government, possibly through the Rigsdag, will decide what further steps shall be taken by the Danish State in this important question."

France

UNITED STATES NOTIFIED THAT FRANCE WILL POLICE FISHERIES OFF NEWFOUNDLAND AND GREENLAND: The French Embassy has sent a memorandum dated January 30, 1950, to the United States Department of State which states that France has detached the 1500-ton French frigate Aventure to police the fisheries off Newfoundland and Greenland in execution of the provisions of the Convention of May 6, 1882.

The convention referred to is the "International Convention for the Purpose of Regulating the Policing of the Fisheries in the North Sea outside Territorial Waters." The signatory nations are Belgium, Denmark, France, Germany, Great Britain, and the Netherlands. The objective of the Convention is to regulate the policing of the North Sea fisheries, except in territorial waters.

German Federal Republic

FISHERIES TECHNIQUES BEING USED TO DEVELOP FISHERIES OF OTHER COUNTRIES: German fishing vessels and techniques are being used to an increasing extent in the development of the fisheries of other countries, reports a May 19 American consular dispatch from Bremerhaven.

Turkey has been exploring the possibility of using Marshall Plan credits to procure 30 to 40 new fishing cutters in Germany, as well as fish-meal and other fish-processing machinery. German experts probably will go to Turkey to supervise the installation and initial operation of the machinery.

The South American countries of Chile, Argentina, and Columbia are reported to be procuring fishing cutters and cutter crews in Germany for use in their own fisheries.

* * * * *

1950 FISHERIES FAIR: The 1950 German Fisheries Fair, which was held in Bremerhaven from May 20 to May 31, inclusive, had an estimated paid attendance of 70,000 persons. Since the fair was well advertised, it attracted people from all parts of Western Germany, the American Consulate at Bremerhaven reports in a June dispatch. The scheduling of the annual conference of German fish wholesalers and retailers in Bremerhaven during this period was a contributary factory in obtaining wide representation.

The objectives of the fair were:

1. To promote the fishing industry;

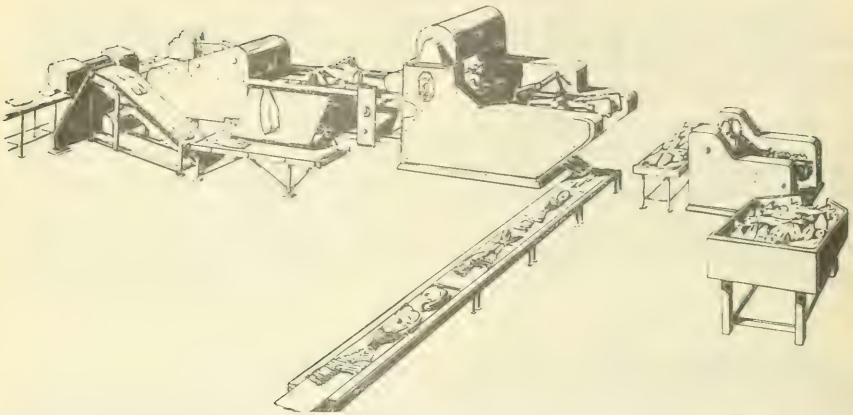
2. To display newly developed products and fishing techniques; and

3. To acquaint the owners of fishing vessels with the latest advancements in ship designs, harbor construction, and related subjects.

There were approximately 350 exhibits, all of which were presented by private or government organizations of West Germany. Fish catching, processing, distribution and preparation, and marine science were represented. In the processing section, a filleting machine designed by the Nordischer Maschinenbau, Rud. Baader, Luebeck, was one of the most recent mechanical developments and attracted considerable interest.

NEW FILLETING MACHINE: The new German filleting machine consists of four units which, when set up in line, occupy a space approximately 35 by 8 ft. One unit removes the head, ventral-fins, and scales; the second, fillets; and the third and fourth, which are identical, skin the fillets. Before processing the fish are gutted by hand.

It is claimed that four persons can fillet from 1,200 to 1,800 fish per hour, obtaining over 5 percent more meat than is possible if the operation is done manually. Two additional personnel are required to pack the fillets as they leave the skinning units.



NEWLY-DEVELOPED GERMAN FILLETING MACHINE CONSISTS OF FOUR UNITS AND OCCUPIES AN AREA OF APPROXIMATELY 35 BY 8 FEET.

The machine can operate without adjustment on fish ranging from 40 to 120 cm. (from over 15 inches to 47 inches) and was designed for European cod, coalfish (pollock), ling, haddock, and others having a similar skeletal structure. It was stated that, because of the high degree of mechanization and precision obtained, the machine was extremely specialized in regard to the varieties of fish on which it can operate successfully.

It was adopted from a circular type, which has been manufactured for several years by the same company, in order to overcome the inability of the latter to fillet freshly-caught fish which are stiff and have not passed the rigor mortis condition. This defect made the circular filleting machine unsuitable for use on vessels. It is planned to operate the new model at sea as well as on shore.

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WHALING: The conversion of a T-2 American tanker, Herman F. Whiton, into a whaling mothership was reported in the February 1950 Commercial Fisheries Review, page 50. The Erste Deutsche Walfang Gesellschaft m.b.H. of Hamburg states that the published wording could lead to a misunderstanding and that the whaling fleet in question represents not a German-American enterprise, but a purely American one. The firm claims that the whole enterprise is controlled by a whaling company with offices in New York City, with the Erste Deutsche Walfang Gesellschaft m.b.H. acting only as the sole agency of the American firm for such purposes as supervision and equipment.

Germany, before World War II, was the largest whale oil consumer in the world and frequently bought more than 45 percent of the world production of whale oil. The average production and consumption figures of 1932/33 and 1935/36 clearly illustrate that the German average annual consumption at that time amounted to 203,000 metric tons out of a world whale oil production of 454,456 metric tons.

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CULTIVATION OF FRESH-WATER FISH: In southern Germany, and particularly in Bavaria, fresh-water fish are cultivated on a commercial scale in specially constructed ponds, a May 19 American consular dispatch from Bremerhaven reports. In unfertilized ponds in Bavaria, an average annual yield of 90 pounds per acre has been obtained; in fertilized ponds, the yield has reached 195 pounds per acre.

Carp and trout are the fish usually cultivated, and are sold alive. At the end of March 1950 in Munich, live trout were being retailed at approximately 76 cents a pound; live carp were selling at 43 cents per pound.

MODERNIZATION OF HIGH-SEAS FISHERY HAS INTERNATIONAL IMPACT: Although Germany is not a fish-exporting country, the modernization of the German high-seas fishery has had an international impact. Iceland has been particularly affected. Having sold Germany 60,000 metric tons of iced fish in 1949, Iceland was able to sell only about one-third of this amount in 1950 under the German-Icelandic trade agreement negotiated early in 1950. This agreement limited Icelandic fish exports to a value of $2,500,000.

The decline in fish prices in Germany further posed the problem to the Icelandic Government of either increasing the subsidy to Icelandic trawlers landing fish in Germany or devaluing the Icelandic krona. This latter course of action was decided upon and put into effect on March 19, 1950.

The large Icelandic trawlers of 600 gross registered metric tons have been used chiefly to deliver iced fish to Germany and England. Due to the limitation of Icelandic fish deliveries to the period of the German herring season, such vessels will not be able to operate nearly so economically this year, and some privately-owned Icelandic trawlers may be sold or chartered to German operators. Two large Icelandic trawlers, built in Bremerhaven in the late 1930's, have been offered to a newly-founded, joint Icelandic-German firm in Bremerhaven at less than $142,800 apiece, with one-half the purchase price to be paid by exports of German products to Iceland over a five-year period. The association of German Trawler Owners is opposing the registry of these two trawlers in Germany. However, three Belgian trawlers were purchased by Bremerhaven firms during the first quarter this year and were converted to German registry.

India

EXPERIMENTS WITH CHEMICAL ICE FOR PRESERVING FISH: Experiments are being conducted by the Fisheries Department of the West Bengal Government in cooperation with a local ice manufacturing concern for preserving fish in chemical ice, a June 8 American consular dispatch from Calcutta reports. The experiments are directed toward extending the time of preservation of frozen fish after it is taken out of the freezer from 6 hours to 48 hours. The extended preservation, if the experiments prove successful, will facilitate transportation for longer distance and to areas where cold storage or ice-packing facilities are not available.

Japan

EXPANSION OF JAPANESE TUNA-FISHING AREA WILL INCREASE TUNA PRODUCTION: In May the Japanese Government was authorized by SCAP to extend its tuna fishing area as far south as the Equator, and to send tuna-catching fleets into this prescribed area, subject to specific restrictions. Plans have been approved by the Japanese Government to dispatch a fleet of 25 vessels to the authorized area early in June, reports a June 9 American consulate dispatch from Tokyo. It was estimated that this fleet would catch about 3,600,000 pounds of tuna, with an even greater catch of shark and other miscellaneous products. The total value of the fleet's production would probably reach 520 million yen (approximately $1,450,000).

Permission to send tuna-catching fleets as far south as the Equator will greatly increase the availability of tuna on the Japanese local market, as well as permit a larger volume of canned tuna exports.

PEARL INDUSTRY OUTLOOK FOR 1950: Regarding its 1950 operations, the Japanese pearl industry was optimistic, and it was estimated that its production of cultured pearls would be about 413,000 pounds. This is a substantial increase over the 293,100 pounds produced in 1949.

Cultured pearl production was greatly reduced during World War II, and it was not until 1949 that new crops reached significant proportions.

Recent orders, principally from United States dealers, but including Swiss, Canadian, and West German buyers as well, indicate that the volume of trade will be substantially larger than that of 1949, when cultured pearls valued at $2,000,000 went to the export market.

Netherlands West Indies

CURRENT FISH MARKETING SITUATION:[1/] Production of meat and agricultural products in the Netherlands West Indies (the islands of Curacao, Aruba, and Bonaire) is inadequate mainly due to the lack of water. Fish production is limited by preservation facilities, with ice prohibitively priced at $17.50 per metric ton. As a result, imports of fishery products play an important part in the economy of the Islands, according to Robert O. Smith of the U. S. Fish and Wildlife Service, who is conducting the Western portion of a South American survey to determine the possibility of locating South American markets for U. S. fishery products.

1/ This is the second report in a series to give information on current and potential markets for United States fishery products in South America. Milton J. Lindner and Robert O. Smith, United States Fish and Wildlife Service representatives, were in South America during June investigating markets in connection with a survey sponsored cooperatively with the U. S. Department of Agriculture's Office of Foreign Agricultural Relations. More detailed reports will be issued at a later date as "Foreign Market Circulars" and will be available from the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C. The first report in this series was on the Argentine Republic (see Commercial Fisheries Review, June 1950, pp. 33-4).

The population of the Netherlands West Indies is reported to be about 160,000, of which 98,000 are on the island of Curacao, 54,000 on Arúba, and the balance on Bonaire. Ordinarily such a relatively small population would not use a great quantity of fishery products; however, the scarcity of locally-produced meat and agricultural products creates a demand for fishery products.

Production of fishery products in these Islands is estimated to total about 1.1 million pounds annually, or about seven pounds per capita, valued at $397,000 (U. S. currency equivalent).

Imports of fishery products amount to about 20 pounds per capita annually. During the first six months of 1949, the two Islands of Curacao and Aruba imported about 1,600,000 pounds of fresh, frozen, and preserved fishery products, valued at about $360,000 (U. S. currency equivalent).

To explain the unusually large proportion of imports, a number of reasons are advanced. Oil companies operating in the Islands contribute relatively high incomes to the area. These companies operate their own commissaries, supplies for which are purchased from main offices in New York, London, and The Hague. Until recent years, unloading facilities for large vessels were mostly lacking in the Caribbean area and large quantities of cargo were transferred to smaller vessels for final delivery. Approximately 10,000 ship arrivals and departures are reported annually.

Import licenses are not required except for shipment from European countries. There is no inspection prior to entry, nor any specific labeling requirements, or packaging preferences. All containers should show net weight in metric units.

Recently, a Netherlands economic mission visited the Islands for the purpose of studying the possibilities of increasing the sale of products from the Netherlands. Among the items suggested for heavier exportation to the colony was salted and brined herring.

Norway

FISH FILLET INDUSTRY TO BE DEVELOPED IN NORTH NORWAY: In order to utilize the fishery products in North Norway (where some of the biggest fisheries in the world are located), a large new company is being formed by the Norwegian Ministry of Fisheries, a June 24 news release from the Norwegian Information Service reports. Development of a fish fillet industry will be one of the main activities of the company, along with the production of fish meal and the preparation of dried fish.

The State will be the biggest shareholder in this new company, but stock will also be held by the Norwegian Fishermen's Organization, the Norwegian Trade Union Congress, and other organizations connected with Norwegian fisheries. The company will take over existing factories in North Norway and develop the industry further.

The initial capital will be about $1,680,000, and it will later be increased to $2,800,000. Through their organizations, fishermen will exercise a strong influence in the business administration of the company.

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PLANS TO DOUBLE FROZEN FISH EXPORTS TO THE UNITED STATES: After extensive marketing surveys and the employment of an American market counsellor, the Norsk Frossenfisk A/L (marketing and export sales agent for all Norwegian fish-refrigerating plants) began distribution of frozen fish in the United States in January 1948. An official of this company (which has been extremely active in the stimulation of Norwegian exports) states that from January 1948 through mid-1950 a total of 2,086 metric tons of frozen fish have been shipped to the United States. Current exports to the United States are at the rate of 1,000 tons annually, but it is anticipated that within the next six months this rate will be doubled, a June 8 American Embassy dispatch from Oslo states.

This company is investigating the possibilities of inspection by the U. S. Food and Drug Administration or by Norwegian government official inspectors designated to conduct inspections (according to United States standards) of monthly shipments of frozen fish to the United States at places of embarkation in Norway.

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LARGE PARTICIPATION EXPECTED IN TUNA FISHERY: A survey by Norway's Raw Fish Association recently indicated that about 200 fishing vessels were planning to seek tuna this summer, according to the May 16 Fiskaren, a Norwegian trade publication. This compares with only 20 to 25 vessels which fished in 1949, and not more than 10 or 15 in 1948. Most of the vessels plan to operate along the Nordland and Nord Trondelag coasts.

From the standpoint of export possibilities, the Sales Committee of the Association is considering what regulations will be necessary because of the unexpectedly large participation in the tuna fishery this season.

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USE OF MONONATRIUM IN CANNING HERRING: Experiments and research on the use mononatrium to improve the quality of canned herring or fishery products are still being conducted and definitive conclusions have not yet been made, according to the latest information supplied by the American Embassy at Oslo in a dispatch dated April 20. This flavoring (mononatrium) was discovered at the Norwegian Canned Fish Industry's Quality Control Laboratory in Stavanger (see Commercial Fisheries Review, May 1950, p. 77).

According to the Norwegian Canners' Association, the Laboratory was issued USA patent 2461651 on February 15, 1949, covering the use of mononatrium in fish canning.

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EXPANSION OF HERRING OIL AND MEAL FACTORIES: For expansion of facilities of existing herring oil and meal factories, and for the building of new ones in West Norway, the Norwegian Government will guarantee a loan of $630,000 to a Norwegian company, the Norwegian Information Service reported on June 24.

The capacity of the Egersund factory will be increased from 5 to 10 thousand barrels per day; the Moltustrand factory from 5 to 15 thousand barrels; and the Horsöya factory from 9 to 14 thousand barrels. A new factory will be built at Florö to handle 15 thousand barrels a day.

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HERRING OIL FACTORIES TO PRODUCE FISH SOLUBLES: Two Norwegian herring oil factories have started condensation of stickwater on an industrial scale, the Norwegian Information Service reported on June 17. Stickwater is the liquid left over in the so-called reduction process after recovery of the dry matter (herring meal) and the separation of the oil. In the past, this liquid has been allowed to run to waste. The stickwater contains 5 to 7 percent total solids, by far the greater proportion of which is in solution. Most of these total solids consist of protein and protein-degradation products. In addition, the stickwater contains a number of B vitamins of great practical importance and in comparatively large amounts.

The stickwater may be utilized in various ways. Either fluid or powdery products may be obtained. Production of concentrates in liquid form is carried out by evaporation of the stickwater, mostly in vacuum. Provided the viscosity is no hindrance, the stickwater is reduced to a concentration of about 50 percent total solids. In order to improve its keeping qualities, acid (usually sulphuric acid) is added to the stickwater either before or after concentration. The fluid, viscous concentrate is shipped in barrels or in tanks.

Because of their high concentration of "animal protein factors" (APF), including vitamin B_{12}, the "herring solubles" are a valuable supplement to vegetable protein in the feeding of hogs and poultry. Relatively small quantities of the solubles added to the feed--a proportion of 3 to 5 percent--are usually sufficient to meet the APF requirements.

WHALE OIL PRICE JUMPS: The whale oil from the Anglo Norse and Jarama Norwegian expeditions off West Africa this summer has been sold in advance to Continental buyers at $280 per metric ton. Last year the Anglo Norse and Jarama expeditions produced 19,000 tons of whale oil. A similar output this summer should be worth almost $558,000.

Whale oil produced in the Antarctic this past season was sold in advance last fall for $224 per ton. But whaling circles expect to obtain $280 per ton for whale oil produced in the Antarctic next season.

The European market for whale oil has recently become very firm because of disappointing supplies of vegetable oil. Deliveries from the East Indies are hampered by strikes and other difficulties. It is also possible that stockpiling due to the "cold war" has increased the demand for fats. Tonsberg Blad, a Norwegian newspaper, also believes that the devaluation of sterling has helped to increase the price of whale oil.

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WHALING IN THE ANTARCTIC.

WHALING ENTERPRISES FORM POOL: With respect to Norwegian efforts to maintain a monopoly position in Antarctic whaling, newspapers in Norway recently reported the formation of a pool comprising all Norwegian whaling enterprises and the conclusion of an agreement on the part of the pool with British whaling interests to maintain minimum price schedules for the sale of whale and sperm oil through the world, a June 28 American Embassy dispatch from Oslo states. Although full details of this agreement have not been

made public, private Norwegian whaling interests and other sources have confirmed the existence of the pool and of the agreement with British whaling interests.

Panama

PLANS EXPORTS OF FROZEN FISH TO U. S.: A new Panamanian firm proposes to engage in the fishing industry and export frozen fishery products to the United States, reports a June 23 American consular dispatch from Panama City. The exportation of shrimp, fillets of jewfish, red snapper, black snapper, mackerel, corvina, swordfish, tuna varieties, and other species are expected to be an important phase of the operations of the new company.

Peru

GERMAN-PERUVIAN COMMERCIAL AGREEMENT: A Commercial Agreement signed May 12, 1950, in Frankfurt-on-Main between the Federal Republic of Germany and Peru includes fishery products, states a June 9 American consular report from Lima. The agreement provides reciprocal most-favored-nation treatment and settlement of trade balances in free American dollars, in addition to other conditions. German imports into Peru will still be subject to Peruvian import control regulations which establish a "List of Permitted Imports." The agreement will be in force for one year and will be extended automatically for a similar period unless one of the Parties denounces it with an advance notice of 90 days.

Germany will import from Peru $30,000 of canned and frozen fish and $210,000 of fish meal; however, the amounts indicated do not represent maximums, and may be exceeded.

No fishery products are included in the list of German exports to Peru.

Portugal

GREAT BRITAIN CONTRACTS FOR PORTUGUESE SARDINES: Representatives of the British Ministry of Food on June 2 signed a collective contract with the Portuguese Canned Fish Institute for the purchase of 500,000 cases of sardines of the current season's pack at a price of 290 escudos (approximately $10.00) per case, according to a June 22 American consular dispatch from Lisbon. This agreement is in accordance with the arrangements already made for Anglo-Portuguese trade during 1950.

The quantity contracted for is a maximum, and if the Portuguese production fails to reach 2 million cases, 25 percent of the actual output will be reserved to fulfill the British contract. If the maximum amount of 500,000 cases should be supplied, the transaction would amount to approximately £ 1,800,000 ($5,000,000) and the assured market thus established would have a stablizing effect on the canning industry, which has been hard hit by two successive years of sardine shortages and reduced exports.

The sardines will be packed in the quarter-club size ($4\frac{1}{2}$ oz. net weight). The first shipment will reach Great Britain at the end of the year and supplies will be on sale in that country early next year.

The Portuguese sardine fishing season began in May, with some good runs reported from the coast of southern Portugal in May and early June, arousing hopes of an alleviation of the scarcity which has prevailed in the past two years.

Spain

SPANISH "PAIRS" SUCCESSFUL FISHING OFF NEWFOUNDLAND: This year, for the first time, a number of Spanish "pairs" (Spanish system of drag-net fishing by two vessels[1/]) fished the Newfoundland banks. These vessels are now reported returning to Spain after staying away 30 to 35 days (of which only 10 days were spent in actual fishing), and it is indicated that they have been exceptionally successful. Catches of 80 to 100 metric tons per "pair" were reported, according to a June 12 American consular dispatch from Bilbao.

Under present Spanish Government regulations, the vessels can sell in the fresh state only 25 percent of this catch on the market at Bilbao. The balance is to be salted and set aside for the national market and for the months to come.

1/ See Commercial Fisheries Review, May 1950, pp. 81-4.

U.S.S.R.

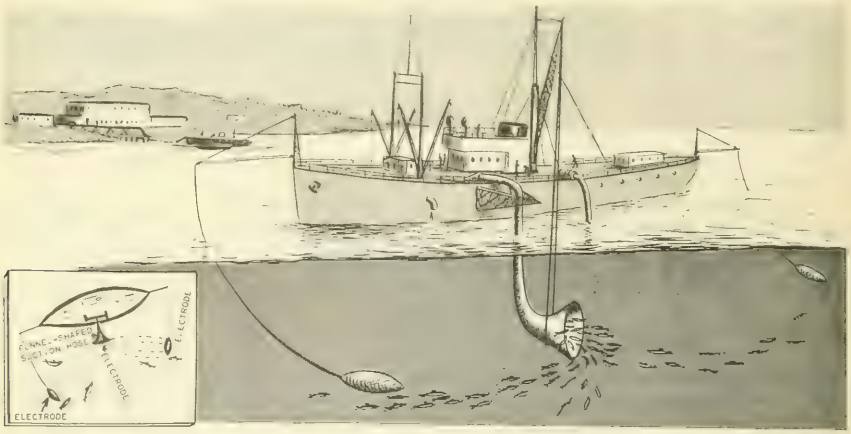
ELECTRICAL FISHING EXPERIMENTS WITHOUT A NET: Based upon present known methods of discharging fish from the holds of vessels with a vacuum pump, Soviet engineers claim they are experimenting with the same method for electrically catching and suctioning fish into the hold of fishing vessels directly from the river.

A Soviet engineer, M. F. Cernigin, claims that after much experimental work in the Lake Trust, the following electrical method of catching fish without a net was developed, according to an article which appeared in the Ceskoslovensky Rybar, a Czechoslovakian fishery periodical.

The vessel was equipped with an electrical pump and a high-voltage installation. On the river bottom, cables from the local power plant were laid. A rubber suction hose was lowered into the stream. Attached to the end of the hose lowered into the stream was a funnel-shaped tube. This was connected with the high voltage installation--the electrode. At a certain distance away there were two floats to which were attached metal plates, and high voltage wires were conducted to these plates under water. From an observation post on the boat, it was possible to observe what was going on in the depths of the stream.

At first when the pump was lowered, no fish entered the funnel-shaped opening. However, when the current was turned on, all the fish that were between the funnel and the electrode rushed towards the funnel. The current attracted the fish towards the funnel and the suction pulled the fish into the tube. In a steady stream, the fish were caught and suctioned into the hold of the vessel. With the use of this electrical fishing method, 2,500 pounds of fish were caught in eleven hours. Fish

were not damaged, and they were distinguishable from fish caught by other methods only by their fresh and clean condition. At the dock, the fish were suctioned from the hold of the vessel to the shore plant.



THE SKETCH GIVES AN ARTIST'S CONCEPTION OF THE USE OF THE SOVIET ELECTRICAL FISHING METHOD. AT A DISTANCE IN FRONT AND BEHIND THE BOAT, ELECTRODES HAVE BEEN PLACED. A SUCTION HOSE WITH A FUNNEL-SHAPED OPENING IS LOWERED INTO THE WATER. WHEN THE ELECTRIC CURRENT IS TURNED ON, THE FISH MOVE TOWARD THE FUNNEL AND ARE SUCKED, WITH THE WATER, TO THE HOLD OF THE SHIP. THE SURPLUS WATER IN THE HOLD IS PUMPED BACK INTO THE SEA. IN THE UPPER LEFT IS SKETCHED THE SHORE PLANT SHOWING HOW THE FISH ARE UNLOADED BY MEANS OF A VACUUM PUMP FROM THE HOLD OF THE VESSEL INTO THE PLANT.

Electrical fishing is not yet a reality, the Soviet engineer declares, but it is very promising. Only two persons are needed for fishing with this electrical method. Nets will be unnecessary. It will be possible to fish in stormy weather. However, according to the Soviet engineer, "there is much work ahead of us before electrical fishing can be placed at the service of the State."

RUSSIAN VESSELS EQUIPPED WITH LAMPS FOR FISHING: Numerous large Russian vessels in the Caspian Sea are equipped for fishing with electric lamps, according to Russian sources in London, the April 27 Fiskaren, a Norwegian periodical, reports. Last year many thousands of tons of brisling were caught in the Caspian Sea after having been lured up to the surface by powerful searchlights. This year the number of fishing craft so equipped will be doubled.

The Russian fishing fleet in the Pacific, according to the same source, uses "undersea electric rays." The current causes the brisling to move in the direction the fishermen desire when the brisling are ready to be caught.

The first Russian experiments with electric fishing were carried out in Astrakan and Murmansk in 1936.

United Kingdom

EFFECTS OF DECONTROL OF FISH PRICES: The decontrol of fish prices and the end of the flat-rate transportation subsidy on April 15, 1949, in Great Britain brought into public discussion the critical situation of the entire British fishing industry, reports a May 22 American Embassy dispatch from London. The end of the transportation subsidy, which enabled fish landed at the northern ports to compete in the main fish markets, brought a storm of protests from the Scottish fishing industry.

Removal of price control was followed by an immediate sharp rise in prices, due also, in part, to the fact that weather conditions during the week end and immediately preceding it (April 15) had reduced landings at many ports. Stiff consumer resistance to the high prices quickly reduced them to more or less the levels at which they had been controlled, but the situation was not stable and price fluctuations were recognized as inevitable.

By the middle of May, or just a month after the price controls were removed, fish prices had again fallen sharply and reports from fishing ports stated that trawlers were being tied up and fishermen were out of work, as it was impossible to cover expenses of operation at current prices. The British Trawlers' Federation, which controls 700 out of the total of 1,100 British trawlers in operation, appealed to the Ministry of Agriculture for aid to the fishing industry which, the Federation states, is on the verge of collapse. The Federation considers this state of affairs due to the following causes:

1. Excessive and uncontrolled dumping of foreign-caught fish in this country.

2. The effect of oppressively high operating costs allied with the public's incapacity to pay correspondingly higher prices.

3. The fact that fish has to compete with other staple foods which, but for the food subsidy, would be on a price parity with fish.

4. A reaction by the public against fish as a diet in consequence of the sort of fish which was enforced upon them by reason of food shortages during the past ten years and also as a result of the poor quality of fish, much of which was imported when other fish was not obtainable.

5. A general reduction in catches in home waters due to overfishing by all Western European countries.

The question of aids to the fishing industry has been raised several times in Parliament, and it is expected that some action may be taken by the Government in this direction. However, there are good reasons advanced for giving the free market time to adjust itself, particularly since the current supply of eggs and other foods which can be used as a substitute for fish is seasonal, and since there is room for improvement in the handling and selection of fish offered for sale to consumers who are becoming more selective in their demand for fish.

During the first quarter of 1950 there were continued complaints of the critical condition in which the fishing industry found itself, due chiefly to rising costs and, it was claimed, to the prejudicial effect of imported fish on the market for the British catch. In this connection, it may be noted that while the landings

by the home fleet showed a decline during the quarter, imports of fresh and frozen fish also dropped sharply as compared with the same quarter of 1949.

Removal of the subsidies has given rise to retail price increases and some concern is felt lest the uncertainty as to prices and supply of fish in the retail markets may not result in a more or less permanent drop in consumer demand for fish.

ECHO-SOUNDING DEVELOPMENTS IN THE EUROPEAN FISHERIES AS REPORTED TO THE INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA: Latest developments in echo-sounding were the subject of some of the scientific papers presented at the meeting of the International Council for the Exploration of the Sea in Edinburgh, Scotland, in October 1949. These papers reported on methods of using echo sounders to identify schools of fish, to discover the behavior of fish schools under different conditions, and to study the action of fish nets while trawling.

One of these papers, delivered by Dr. William C. Hodgson of the Fisheries Laboratory at Lowestoft, England, presented a general survey of the use of the echo sounder for spotting schools or shoals of fish, and described the recorded traces that appeared when the echo sounder contacted different species of fish. A brief version of this paper is given in the following paragraphs.

Dr. Hodgson commenced with a brief historical resume of the development of the echo sounder. The first echo sounder of the sonic type to be installed on a fishing vessel was one which used sound waves of low and audible frequency. The machine, which consisted of an electric hammer for producing the impulse and a hydrophone for receiving it, was fitted to a steam trawler out of Hull, England, in 1928. It was found to give accurate soundings to a depth of 270 fathoms. Later, in 1933, the first recording instrument used in fishing was installed in the steam trawler Glen Kidston by Henry Hugnes and Sons. This machine used a magneto-striction ultra-sonic oscillator and it recorded the depth electrolytically on a roll of paper. The first cruise made from Hull to Bergen with this instrument aboard was a historic one, for the skipper was able to produce a continuous trace of the sea bed on paper to a scale of 70 fathoms to 5 inches of paper.

In 1935, Oscar Sund, using this type of machine on the Norwegian coast, made the first identified record of fish; in this instance they were cod. On the Lofoten grounds in the following year, he was successful in producing records of herring shoals. The success of these experiments firmly established the recorder in the Norwegian fisheries as a suitable instrument for discovering cod, herring, and and brisling.

Dr. Hodgson pointed out that, since these early experiments, there has been a progressive development in the effective use of echo-sounding equipment. It has been especially noticeable after the recent war that a great increase in the use of the sounder for locating shoals of fish has taken place. Both drift gill-netters and purse seiners are now beginning to rely on the information given by the recorder before shooting their nets. Drifters consider the sounder important in finding the exact depth at which the fish are swimming. The importance of this knowledge is realized when it is considered that in the North Sea the greatest depth reached by the nets is 9 fathoms (nets are about 7 fathoms in depth and are suspended from the buoys by ropes which are usually 2 fathoms in depth). In many parts of the North Sea, it has now been found that the herring will rise at night only to within 10 or 15 fathoms of the surface, which means that the drift nets cannot possibly catch the fish unless the buoy ropes are lengthened.

One of the most outstanding discoveries in connection with the use of the sounder is that certain species of fish can be identified definitely by the type of echo recorded on the paper trace. Dr. Hodgson reported that, during the course of the work, a collection of traces has been made of different fish, all of which have been identified either by catching them in nets or by catching them on various forms of hand lines. The observations have resulted in the knowledge that with both herring and pilchards, clear echoes are obtained even when the concentrations are very light. In large masses, too, they are easily distinguishable from each other, for the edge of the herring trace is always diffused--as though it had been shaded with a pencil--while the pilchard trace is dense and the edge appears to be painted with India ink.

Other species of fish show distinctive characteristics in their traces. Small sprat, for instance, show a diffuse, cloudy trace like the herring, but dense shoals of adult sprats usually have peculiar comet-like formations scattered throughout the trace. This has been found to hold true in both the North Sea and the Norwegian sprat shoals.

Cod, coalfish, and pollock all give a trace which seems to be characteristic of these gadoids. They are shown on the records as a series of specks instead of dense shaded traces such as the herring-like fishes produce.

Mackerel traces are unlike any others. These fish produce a striated trace which has a peculiar ribbed appearance, irrespective of the density of the shoal.

In addition to traces of these species of fish which have been identified, other investigators reported that they had traces quite distinct from the above, which probably represented fish of other species. They contemplate continuing work on identifying these fish and relating their appearance to that of the trace.

Another important function of the echo sounder, as related by Dr. Hodgson, has been its use to study the behavior of fish shoals in relation to wind, tide, and light; for it is possible to make a continuous record of the depth at which a shoal is swimming under the influence of these various factors.

In Cornwall, experiments were carried out on the effect of using strong searchlights on the pilchard shoals. It was found that as soon as the light was switched on there was an immediate shock reaction which caused the fish to descend for a few seconds. Then, under the influence of the light, they rose again. When the light was switched off, the fish at once fell to a lower level but rose again as soon as the light was restored.

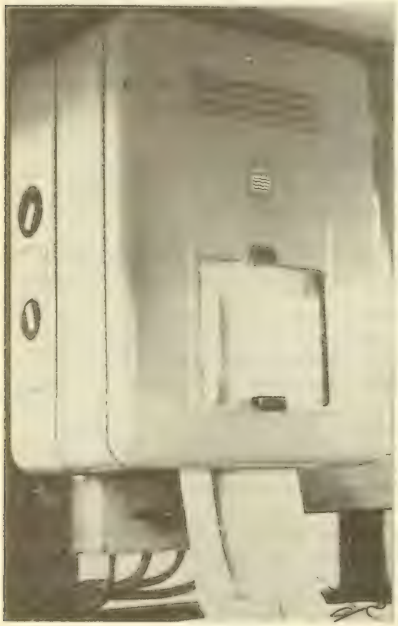
The diurnal migration of sprat also has been studied in the Thames estuary. Here, continuous records show that the fish were at the bottom during daylight, but after sunset they gradually rose to the surface. At dawn, they would sink again to the deeper water.

It was found also that the sprat were packed together in dense shoals during flood tide and also during ebb tide, but at the period of slack water the shoals dispersed so much that it was difficult to obtain echoes from them.

A further and most interesting use of the echo sounder was reported on at the Council's meeting by B. B. Parrish and Henry Wood of the Marine Laboratory at Aberdeen, Scotland. These men had used the echo sounder to study the behavior of trawl nets and had reported on their techniques and results. One vessel shot the trawl net and streamed a float about 60 feet in front of the estimated position of

the headrope of the trawl. The second vessel, equipped with the echo sounder, was towed by the first. By slacking the towline slowly, the second vessel moved backward from the float, and by gently sheering the vessel from left to right it was possible to make a full traverse of the net from side to side and from front to back.

In the foregoing experiment with one small net (specified as a 20-foot trawl), it was found that the headrope or square was 4 feet from the bottom; the sides 3⅝ feet; and the cod end 2⅝ to 3 feet. With another net, called the "Explorer's Trawl" (specified in other papers as a long-winged trawl with 1 112-foot headrope), they estimated the height of the headrope from the bottom as 6 feet. Further observation of this trawl showed that the footrope sometimes rose from the bottom. It had been found previously that this net had caught less flatfish and skate than other trawls; thus it was possible with the echo-sounder to determine that the net was not fishing sufficiently close to the bottom.



THE HUGHES ECHO-SOUNDING MACHINE.

The Europeans, especially the British and Norwegians, have been adapting echo-sounders for the purpose of locating schools of fish for many years, and their instruments have some advantages over those which have been built in the United States. One of their favorite machines is the Hughes Model 20. This machine has a phasing adjustment that most American machines lack. Only 60 feet or 60 fathoms is recorded on the paper at one setting, but the machine can be set to indicate depths down to about 2,000 fathoms. Thus, with one machine it is possible to sound in deep water and also to receive a magnified echo of a school of fish only a few feet thick. Another mixed blessing is the use of wet paper. This paper is wet and fragile and not permanent, but it records echoes very smoothly with a wide range of brown tones. Using this paper, it has been possible to identify the different species of fish by a close study of the striations, comet-like formations, and varying densities of the echoes--effects which are doubtless caused by the schooling habits peculiar to the different species.

It was apparent from the contents of the papers delivered at the recent meetings of the Council and from talks with fishermen and scientists that the echo-sounder has been found to be an important addition to the fishing industry. Fishermen and scientists alike agreed that the echo sounder has become indispensable, not only for navigation, but also for finding fish--thus serving a dual purpose. And with the expected improvements increasing the efficiency of the instruments and the further development of techniques of using them, all were agreed that echo sounders would become even more important.

--Reported by William F. Royce, Fishery Research Biologist, Branch of Fishery Biology, U. S. Fish and Wildlife Service and United States Observer at the meetings of the International Council for the Exploration of the Sea held at Edinburgh, Scotland, in October 1949.

U. S. Trust Territory of the Pacific Islands

NO APPLICATIONS RECEIVED FOR TUNA FISHING IN THE TRUST TERRITORY: The Trusteeship Council of the United Nations in June examined the annual report for the year ending June 31, 1949, on the administration of the Trust Territory of the Pacific Islands under United States administration.

In the examination of this report, the Philippine representative noted, with reference to economic progress in the Trust Territory, that although the right to fish for tuna in the Territory's waters was open to outside companies, no applications from outside had ever been received. The Philippine representative thought that the Administering Authority could train the indigenous people to use the tuna resources for industrial production.

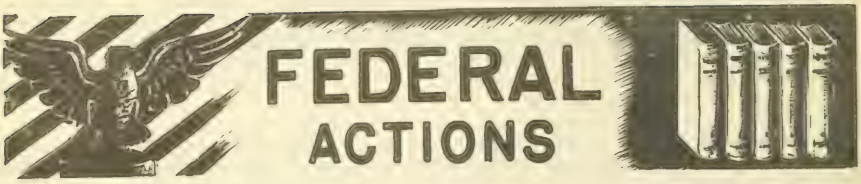
The Special Representative of the Administering Authority declared, at the examination of the report of the Trust Territory, that fishing had been given much attention without any spectacular results.

International

INTERNATIONAL WHALING COMMISSION MEETS IN NORWAY: The second annual meeting of the International Whaling Commission will convene at Oslo, Norway, on July 17. This Commission, established under the terms of the International Agreement for the Regulation of Whaling signed at Washington, December 2, 1946, has the authority to make such regulations of whaling activities as are necessary in the interest of conserving the already badly depleted whaling resources. This Agreement has been ratified by the United Kingdom, the United States of America, Australia, Norway, Iceland, Union of South Africa, U.S.S.R., Panama, Netherlands, France, Sweden, Canada, Mexico, New Zealand, Brazil, and Denmark. Japanese whaling activities conform to the regulations prescribed under the Convention, and SCAP will be represented at the meeting by an observer.

Two standing technical committees, established at the 1949 meeting of the Commission, will hold sessions during the week beginning July 9 in order to prepare certain matters for the consideration of the full Commission.

The United States delegation is composed of Dr. Remington Kellogg, Director of the U. S. National Museum, Commissioner; Dr. H. J. Deason, Chief of the Office of Foreign Activities, Alternate and Advisor; and Fred Taylor, Department of State, Advisor.



Food and Drug Administration

LACK OF INTEREST ON INSPECTION OF FRESH AND FROZEN SHRIMP: Lack of interest was displayed on the part of those who have expressed their views for the expansion of the Food and Drug Administration's Seafood Inspection Service to cover frozen and iced shrimp products, according to a June 21 report from that Agency.

On April 21, 1950, the Food and Drug Administration issued a draft of proposed regulations for the expansion of the Seafood Inspection Service to cover frozen and iced shrimp products. At that time the industry was invited to submit comments and suggestions in writing by May 15, 1950.

In response to requests that informal conferences with interested persons be held, the dates for receiving comments was extended to June 15, and conferences were scheduled. Comments at these conferences and responses to the proposed expansion of the Inspection Service indicate a lack of interest for the expanded service. Therefore, no further efforts will be made to promulgate the regulations in final form unless there are submitted written requests for the expanded service from a substantial portion of the industry. Should a substantial number of requests be received, it will be necessary to study more thoroughly the suggested changes in the regulations before drafting the regulations in final form. In this event, the final regulations cannot be made effective before January 1, 1951.

Current regulations for the inspection of canned shrimp will remain effective for the year beginning July 1, 1950. Applications for Canned Shrimp Inspection Service will not commit the canner to accept the inspection service on frozen and iced shrimp during the applicant's inspection period, if the service is later extended to these products.

Acceptance of the Inspection Service on canned shrimp has never been compulsory. If Inspection Service is eventually established for frozen and iced shrimp, it likewise will not be compulsory.

Department of State

TERMINATION OF TRADE AGREEMENT WITH MEXICO CHANGES UNITED STATES IMPORT TARIFF STATUS OF CERTAIN FISHERY PRODUCTS: Notes have been exchanged between representatives of the Government of the United States of America and the Government of the United Mexican States terminating the trade agreement between the two Governments signed December 23, 1942. As the result of this exchange of notes, the United States - Mexican trade agreement will cease to be in force after December 31, 1950.

As a result of the termination of the trade agreement between the United States and Mexico, which becomes effective January 1, 1951, the following changes in United States import duties and tariff status for fishery products will automatically take place:

Tariff Act or 1930 Paragraph	Description of Product	Current Rate of Duty or Tariff Status	Rate of Duty or Tariff Status After Jan.1,1951
717(a)	White sea bass or totoaba, fresh or frozen (whether or not packed in ice), whole, or beheaded or eviscerated or both, but not further advanced (except that the fins may be removed)	½¢ per lb.	1¢ per lb.
718(a)	Tuna, prepared or preserved in any manner, when packed in oil or in oil and other substances	22½% ad val.	45% ad val.
1761	Abalone, fresh or frozen (whether or not packed in ice), or prepared or preserved in any manner (including pastes and sauces)	Free (bound)	Free
1761	Shrimp and prawn, fresh or frozen (whether or not packed in ice)	Free (bound)	Free

The changes in duty and tariff status will apply to United States importations of these fishery products from all countries.

By legislation it would be possible after January 1, 1951, to change the import duty status of any of the items listed above. Specific or ad-valorem duties could be imposed on duty-free items, and dutiable items could be increased or decreased or changed from a specific duty to an ad-valorem duty or vice versa through legislation.

Since the signing of the trade agreement, Mexico was confronted with a large imbalance in its trade with the United States which resulted in a serious drain on its reserves of dollar exchange. Mexico, therefore, in 1947 took a number of steps--restricted imports (including some items covered by the trade agreement), and changed to the ad-valorem equivalent (or higher) of the duty in 1942 on some 5,000 items not covered by the trade agreement. By the end of that year it became evident that the Mexican Government would also find it necessary to make similar increases in rates on products included in the trade agreement.

Rather than denounce the agreement, the United States agreed to provisional increases by Mexico in duties on the trade-agreement items to levels equivalent on an ad-valorem basis to those provided in the trade agreement when it first came into effect. From the point of view of the United States, this materially lessened the benefits of the agreement, and the Mexican Government agreed on its part to negotiations intended to restore the balance in the agreement through revision of the new Mexican rates on items not previously included in the trade agreement. These negotiations were begun in April 1948.

Since it has proved impossible to achieve a mutually satisfactory revision of the agreement, the two Governments have consequently agreed that it should be terminated.

* * * * *

PACIFIC OCEAN WEATHER STATIONS PROGRAM: The establishment at an early date of a joint Pacific network of ocean weather ships has been agreed upon by the Canadian and United States Governments, it was announced June 23 at Ottawa and Washington by the Canadian Minister of Transport and the United States Secretary of State.

Agreement has been reached on a plan to establish a network of seven stations across the North Pacific to provide an interim program until a broader international agreement can be worked out by the International Civil Aviation Organization.

Five Weather Stations (called "N" for Nan, "O" for Oboe, "Q" for Queen, "S" for Sugar, "T" for Tare) are to be operated by the United States, and one (Station "P" for Peter), by Canada. The Japanese will continue to operate a Station "X" for X-ray in the Far Western Pacific.

The Canadian Government has been operating an Atlantic Ocean weather station at Position "B" for Baker, off the Labrador Coast, on a joint basis with the United States Government. Under the new agreement, the United States will take over complete operation at Station "B", allowing Canada to concentrate her full efforts on the Pacific.

The new agreement is in full conformity with previous international agreements on the establishment and maintenance of weather-ship networks on both the Atlantic and the Pacific.

The agreement marks a significant step forward in ensuring better weather forecasts for both countries, as well as further guarding the safety of transoceanic aviation and shipping.

* * * * *

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES IN FORCE: The International Convention for the Northwest Atlantic Fisheries, opened for signature at Washington from February 8 to 22, 1949, entered into force on July 3, 1950, in accordance with the terms of Article XV thereof which provides that it shall enter into force upon the deposit of instruments of ratification by four signatory governments. The fourth instrument of ratification was deposited on July 3, 1950, by Canada with the United States Government, which is designated by the Convention as the depositary government, the Department of State announced. The United States, Iceland, and the United Kingdom had previously deposited instruments of ratification.

Under the terms of the Convention there will now be established the International Commission for the Northwest Atlantic Fisheries and separate panels for each of the five subareas constituting the over-all area covered by the convention. All contracting governments will be represented on the Commission and those contracting governments having particular fishing interests in each subarea will be represented on the panels of the subareas.

The primary function of the Commission will be to collect, collate, and disseminate scientific information on international fisheries in the Convention area. While the Commission has no direct regulatory powers, any panel may trans-

mit through the Commission to the contracting governments recommendations for measures, based upon scientific information, which are deemed necessary for maintaining those stocks of fish which support international fisheries in the Convention area. Within a specified time after acceptance of such recommendations by the panel governments of each subarea affected, the measures will become applicable to all contracting governments.

* * * * *

UNITED STATES-MEXICO CONVENTION FOR AN INTERNATIONAL COMMISSION FOR THE SCIENTIFIC INVESTIGATION OF TUNA IN FORCE:1/ A Convention between the United States and Mexico for the establishment of an International Commission for the Scientific Investigation of Tuna, signed at Mexico City on January 25, 1949, entered into force July 11 upon the exchange of instruments of ratification by Secretary of State Dean Acheson and Rafael de la Colina, Mexican Ambassador, the Department of State announced during the month.

This Convention provides for a Commission composed of two national sections of four members each, which will engage in scientific investigation of the tuna and tuna-like fish of the eastern Pacific Ocean, as well as those fish which are used for bait in the tuna fisheries. Scientific information now available, based on studies made in the past, is not sufficiently extensive to indicate whether or not tuna stocks are in danger of depletion. The two countries will cooperate under the Convention with a view to maintaining the populations of these fish at a level which will assure a maximum utilization year after year without depletion.

This Convention is similar to the Convention between the United States and Costa Rica for the establishment of an Inter-American Tropical Tuna Commission, signed at Washington May 31, 1949, in that the Commission to be established is an investigatory body and any regulatory measures which are indicated by the study would have to be the subject of future negotiation between the two countries.

1/ See Commercial Fisheries Review, November 1949, pp. 71-2; February 1949, pp.68-9; December 1948, pp.74-7(full text of Convention).

Eighty-first Congress (Second Session)

JUNE 1950

Listed below are public bills, resolutions, etc., introduced and referred to committees, or passed by the Eighty-First Congress (Second Session) and signed by the President during June 1950, which affect in any way the fisheries and fishing and allied industries. Public bills, resolutions, etc., are mentioned under this section only when introduced and, if passed, when they are signed by the President.

PUBLIC BILLS AND RESOLUTIONS INTRODUCED AND REFERRED TO COMMITTEES:

Senate:

S. 3707 (Green, for himself, and Leahy, McMahon, Benton, and Lehman) - A bill to aid in the use, conservation, and development of the natural resources of the river basins in

the New England States and the State of New York and to establish the New England-New York Resources Survey Commission; to the Committee on Public Works.

S. 3765 (Tydings) - A bill to amend chapter 61 (relating to lotteries) of title 18, United States Code, to make clear that such chapter does not apply to contests wherein prizes are awarded for the species, size, weight or quality of fish caught by the contestant; to the Committee on the Judiciary.

S. 3771 (Magnuson) - A bill to provide transportation on Canadian vessels between Skagway, Alaska, and other points in Alaska, between Haines, Alaska, and other points in Alaska, and between Hyder, Alaska, and other points in Alaska or the continental United States, either directly or via a foreign port, or for any part of the transportation. (Companion bill to H. R. 6536, 81st. Cong. 2nd session.)

House of Representatives:

H. R. 8692 (Jackson) - A bill to provide for the conservation of natural fish resources and for an adequate and balanced flow of fish and fish products in interstate and foreign commerce, and for other purposes; to the Committee on Interstate and Foreign Commerce. (This bill has three parts: Price Support, Fisheries Stabilization Corporation Creation, and Marketing Agreements and Orders.)

H. R. 8693 (Mitchell) - Same as H. R. 8692; to Committee on Banking and Currency.

H. R. 8747 (Lane) - Same as S. 3707.

H. R. 8766 (Underwood) - A bill to establish rearing ponds and a fish hatchery in the State of Kentucky; to the Committee on Merchant Marine and Fisheries.

H. R. 8945 (King) - A bill to give effect to the Convention for the Establishment of an International Commission for the Scientific Investigation of Tuna, signed at Mexico City on January 25, 1949, by the United States of America and the United Mexican States, and the Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington May 31, 1949, by the United States of America and the Republic of Costa Rica, and for other purposes; to the Committee on Foreign Affairs.

The following bills introduced prior to June 1, 1950, were not previously reported under this section.

House of Representatives:

H. R. 8378 (Burnside) - A bill to encourage the improvement and development of marketing facilities for handling perishable agricultural commodities; to the Committee on Agriculture (May 4, 1950).

H. R. 8485 (Phillips of California) - Same as H. R. 8378; to the Committee on Agriculture (May 11, 1950).

H. R. 8083 (Spence) - A bill to amend the Export-Import Bank Act of 1945, as amended (59 Stat. 526,666; 61 Stat. 130), to vest in the Export-Import Bank of Washington the power to guarantee United States investments abroad; to the Committee on Banking and Currency (April 18, 1950).

H. J. Res. 453 (Sabath) - Joint resolution authorizing the President to invite the States of the Union and foreign countries to participate in the First United States International Fair, to be held at Chicago, Illinois, August 7 through 20, 1950; to the Committee on Foreign Affairs (April 6, 1950).

TREATY RATIFIED:

Convention between U. S. and Canada for Port Privileges to Halibut Fishing Vessels:

On June 27, the Senate ratified convention between U. S. and Canada, for extension of port privileges to halibut fishing vessels on the Pacific coasts of these two nations, signed at Ottawa on March 24, 1950 (Exec. M, 81st Cong., 2nd sess.).

BILLS SIGNED BY THE PRESIDENT:

Public Law 535 (H. R. 7797) - An act to provide foreign economic assistance. Signed June 5, 1950. (Includes Title I - Economic Cooperation Act of 1950; Title II - China Area Aid Act of 1950; Title III - United Nations Palestine Refugee Aid Act of 1950; Title IV - Act for International Development; Title V - International Children's Welfare Work.

Public Law 584 (S. 3771) - An act to provide transportation on Canadian vessels between Skagway, Alaska, and other points in Alaska, between Haines, Alaska, and other points in Alaska and between Hyder, Alaska, and other points in Alaska or the continental United States, either directly or via a foreign port, or for any part of the transportation. Signed June 29, 1950.

CONGRESSIONAL REPORTS:

House of Representatives:

Committee reports (available only from the committee) on bills reported in this section:

Committee on Merchant Marine and Fisheries

Report No. 2331 (June 26, 1950), 5 p. printed, to accompany H. R. 7887, granting the consent and approval of Congress to an amendment to the Atlantic States Marine Fisheries Compact,

and repealing the limitation on the life of such compact. Bill reported favorably with an amendment by the Committee and passage recommended.

Report No. 2329 (June 26, 1950), 3 p. printed, to accompany H. R. 7209, authorizing and directing the United States Fish and Wildlife Service of the Department of the Interior to undertake a continuing study of the shortage of white shad, herring, and other fish in the Albemarle and Pamlico Sounds and tributaries with respect to the biology, propagation, and abundance of such species, to the end that such Service may recommend appropriate measures for arresting the decline of valuable food fish for increasing the abundance and promoting the wisest utilization thereof. Bill reported favorably with amendments by the Committee and passage recommended.

Report No. 2327 (June 26, 1950), 3 p., printed, to accompany H. R. 6533, to provide that the United States shall aid the States in fish restoration and management projects, and for other purposes. Reported favorably with amendments by the Committee and passage recommended.

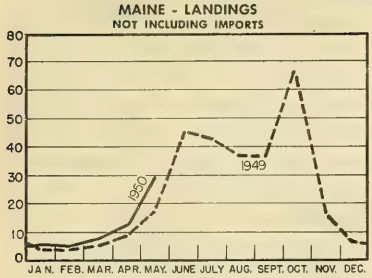
THE SHRIMP AND THE SHRIMP INDUSTRY OF THE SOUTH ATLANTIC AND GULF OF MEXICO

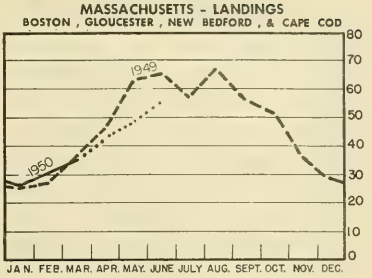
The shrimp fishery of the United States is centered primarily in the eight South Atlantic and Gulf States where almost 200 million pounds are taken annually. The shrimp ranks first in value among all the fisheries of the South and usually rates as the sixth most valuable fishery of the United States, including Alaska. There are three species of shrimp, all members of one family (Penaeidae) which are of commercial importance in this area. The common shrimp, Penaeus setiferus, yields at least 95 percent of the total catch whereas the grooved shrimp, Penaeus brasiliensis, and the sea bob, Xiphopenaeus kroyeri, produce the remainder.

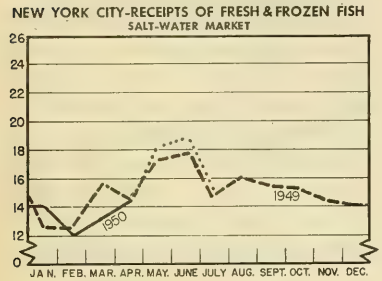
--Fishery Leaflet 319

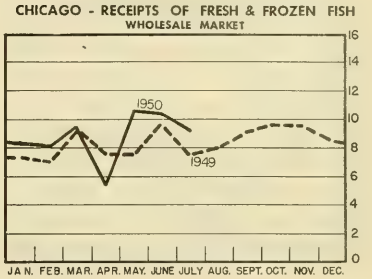
LANDINGS AND RECEIPTS

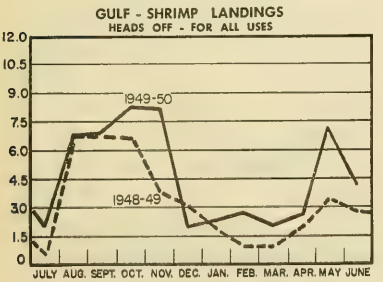
In Millions of Pounds

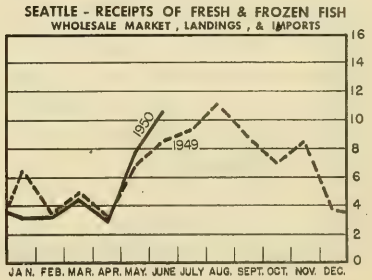




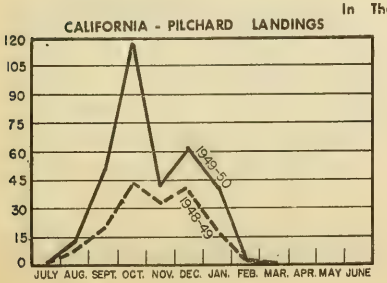


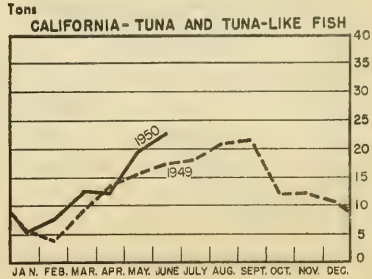






In Thousands of Tons



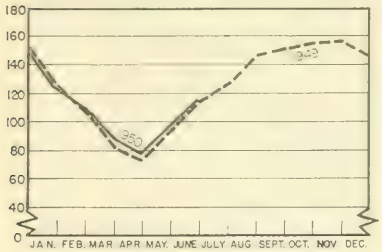


••••••• ESTIMATED

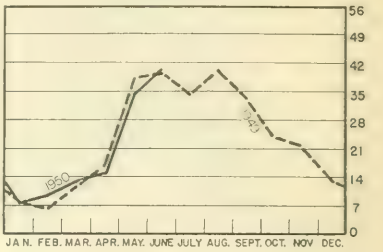
COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

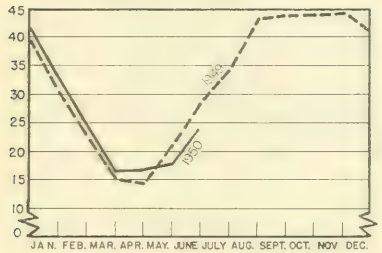
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



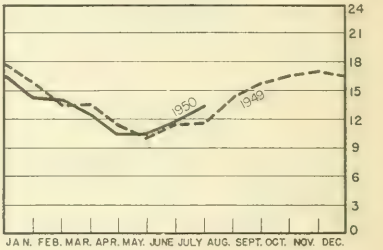
U.S. & ALASKA - FREEZINGS



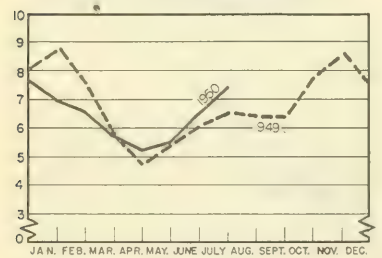
NEW ENGLAND - HOLDINGS OF FROZEN FISH



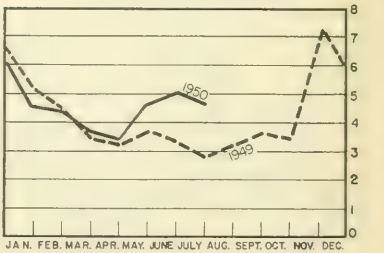
NEW YORK CITY - HOLDINGS OF FROZEN FISH



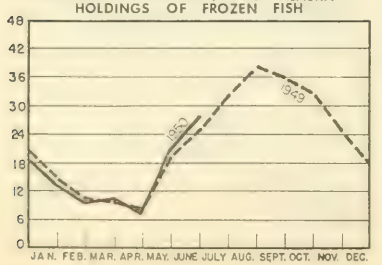
CHICAGO - HOLDINGS OF FROZEN FISH



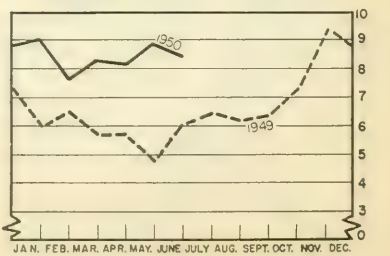
GULF - HOLDINGS OF FROZEN FISH



WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH



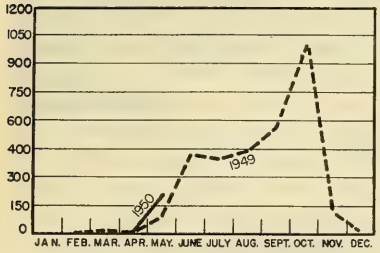
CALIFORNIA - HOLDINGS OF FROZEN FISH



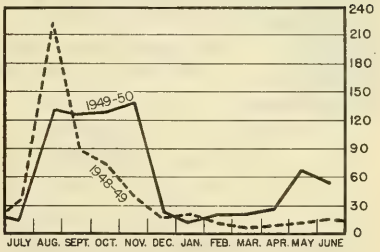
CANNED FISHERY PRODUCTS

In Thousands of Standard Cases

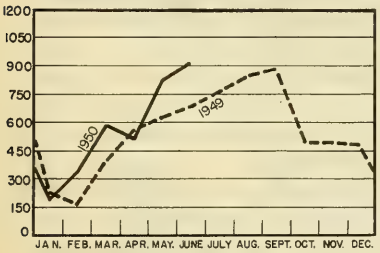
MAINE - SARDINES, ESTIMATED PACK



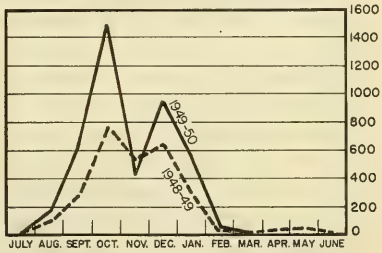
UNITED STATES - SHRIMP



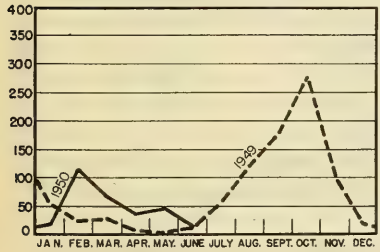
CALIFORNIA - TUNA AND TUNA-LIKE FISH



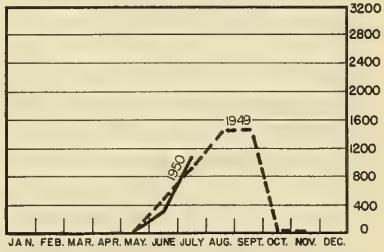
CALIFORNIA - PILCHARDS



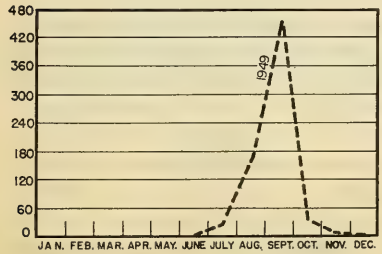
CALIFORNIA - MACKEREL



ALASKA - SALMON



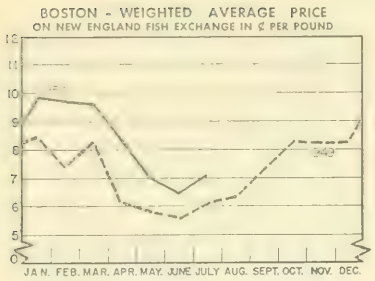
WASHINGTON - PUGET SOUND SALMON

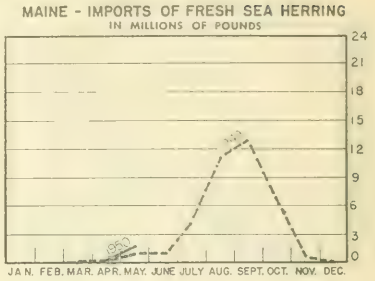


STANDARD CASES

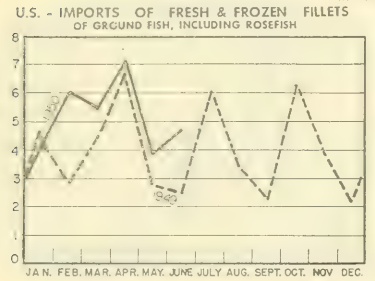
Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	—	5 oz.
TUNA	48	No. 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound tall	16 oz.

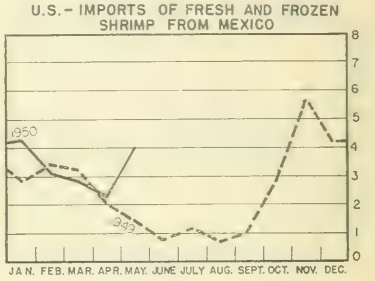
PRICES . IMPORTS and BY-PRODUCTS



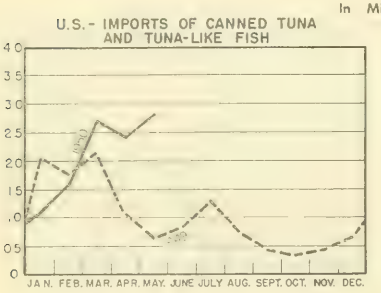


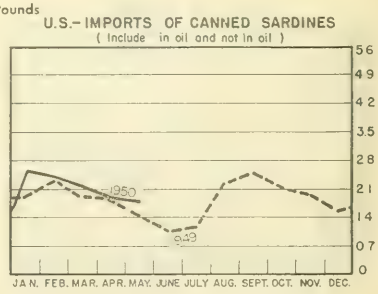
In Millions of Pounds

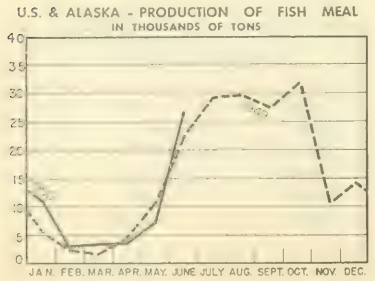


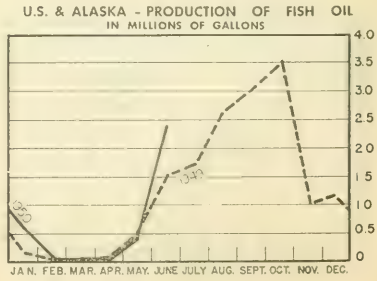


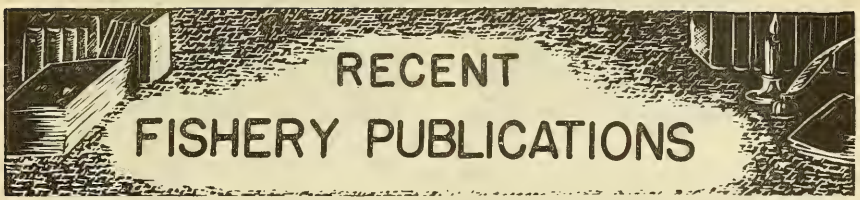
In Millions of Pounds











Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
WL - WILDLIFE LEAFLETS.

SSR-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-546	- Frozen Fish Report, Final, May 1950, 10 p.
CFS-548	- Maine Landings, by Counties, 1949 Annual Summary, 11 p.
CFS-549	- Fish Meal and Oil, April 1950, 2 p.
CFS-550	- Texas Landings, April 1950, 4 p.
CFS-552	- Frozen Fish Report, Final, June 1950, 10 p.
FL -254 (Revised)	- List of Fishery Associations in the United States and Alaska, 9 p.
FL -253 (Revised)	- List of Fishermen's and Fish Shore Workers' Unions in the U. S., Alaska, and Hawaii, 9 p.
FL -365	- Sales Patterns for Fresh and Frozen fish and Shellfish, 1936 and 1946, 102 p.
FL -372	- Report on the Fisheries Industry in the Republic of Korea, 37 p.
FL -374	- Freezing and Canning King Crab, 9 p.
FL -375	- A Survey of the Commercial Fishery Possibilities of Seward Peninsula Area, Kotzebue Sound, and Certain Inland Rivers and Lakes in Alaska, 24 p.
FL -376	- Albacore Tuna Exploration in Alaskan and Adjacent Waters--1949, 34 p.
SL -28 (Revised)	- Wholesale Dealers in Fishery Products, Michigan, 1950, 2 p.
Sep.-253	- "John N. Cobb" Uses New Rig for Slow-Speed Trolling.
Sep.-254	- Studies on Methods of Extracting Vitamin A and Oil from Fishery Products--Part III - Experiments on the Extraction of Low-Oil-Content Livers with Petroleum Ether by the Shaking Method.

WL-330--Organizations and Officials Concerned with Wildlife Protection: 1950, 35 p. Lists the names and addresses of officials and organizations concerned with the protection or management of fish and wildlife. It includes U. S. Federal and state government agencies, Canadian Dominion and provincial government bodies, Latin American government organizations, and various private groups.

- - - - -

SSR-Fish. No. 20--The Gonads of Skipjack from Palao Waters, by Kizo Matsui, 5p., illus., processed, April 1950. Limited distribution. A translation from Japanese. While the author was engaged in a study of the brain of the skipjack tuna at the Palau Tropical Biological Station from September 1941 to January 1942, he was able also to make some observations of the gonads of some of these fish. This paper reports on these observations. The opinion which the author has reached from the results reported in this paper is that if the annual changes in the degree of ripeness of the gonads could be ascertained in every area where skipjack are taken, some clarification of the problems of the location of spawning grounds and the migrations of the species could be attained.

* * * * *

THE FOLLOWING SERVICE PUBLICATION IS AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED IN THE REVIEW.

Production of Fishery Products in Virginia, Maryland and North Carolina (as reported to Hampton Fishery Market News Office), 28 p., processed, May 1950. (Available free from the Market News Service, U. S. Fish and Wildlife Service, P. O. Box 447, Hampton, Va.) In addition to a review of the trends in the production of fishery products in certain areas of Virginia, Maryland, and North Carolina, this publication contains statistical data by months and species on the landings of fishery products in the areas of Morehead City, North Carolina; Hampton Roads, York River, Lower Northern Neck, Eastern Shore, Virginia; and Ocean City, Cambridge, and Crisfield, Maryland. Comparative data for 1946 by areas and species are also given as well as a table showing the shrimp landings in certain North Carolina localities by areas and months.

* * * * *

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

"Age and Length Composition of the Sardine Catch off the Pacific Coast of the United States and Canada in 1949-50," by Frances E. Felin, Anita E. Daugherty, and Leo Pinkas, article, California Fish and Game, July 1950, vol. 36, no. 3, pp. 241-9, illus., printed. Division of Fish and Game, California Department of Natural Resources, San Francisco, Calif. This is a fourth report on age and length composition of the catch of sardine (Sardinops caerulea) off the Pacific Coast of the United States and Canada and covers the 1949-50 season.

Annual Report 1949 (International Pacific Salmon Fisheries Commission), 34 p., printed, illus. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1949. A report of the Commission's regulation of the sockeye salmon fisheries within the waters outlined by the Convention between Canada and the United States for the protection, preservation, and extension of the sockeye salmon fisheries in the Fraser River system. Reports on the meetings of the Commission, the 1949 regulations, the United States fishery, the Canadian fishery, fishing intensity, the Indian catch, escapement, the 1950 cycle, rehabilitation of barren areas, and discusses general biological investigations.

Bulletin III (International Pacific Salmon Fisheries Commission), 129 p., printed, illus. 1--A Biological Study of the Effectiveness of the Hell's Gate Fishways, by G. B. Talbot pp. 1-80; 2--Variations in Flow Patterns at Hell's Gate and Their Relationships to the Migration of Sockeye Salmon, by R. I. Jackson pp. 81-129. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1950. Fishways at Hell's Gate were completed by the spring of 1946 for the purpose of remedying the recurring mortality in order to restore the Fraser River sockeye run. The first of the reports in this publication is an analysis of the Hell's Gate tagging work carried out by the Commission between 1943 and 1947. This analysis was undertaken to determine the effectiveness of the new fishways in eliminating the periodic block to the passage of adult sockeye. In addition, information was desired as to the success of passage by sockeye at extreme high and low water levels which had not occurred during the Commission's investigations in previous years. The second report in this bulletin presents an analysis of the physical data obtained at Hell's Gate by the Engineering staff of the Commission. Engineering studies designed to determine the causes of the obstruction were begun at Hell's Gate shortly after evidence of the obstruction was obtained. The successful cooperation between the biological and engineering staffs of the Commission in solving problems relating to both branches of science has resulted in the alleviation of the Hell's Gate obstruction through installation of a new type of fishway designed by Commission engineers. The Commission reports that the Hell's Gate fishways are operating successfully, and that the construction at Hell's gate has been eliminated.

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(California) Statistical Report of Fresh and Canned Fishery Products (Year 1949, including Sardine Season 1949-1950 and Recapitulation of the Case Pack of Tuna, Bonito and Yellowtail, 1918-1949), Circular No. 24, 27 p. of tables, printed. Bureau of Marine Fisheries, California Division of Fish and Game, San Francisco, Calif., 1950. The tables in this publication show the California landings of all fish and shellfish by species and by main fishing areas, including the amount of pilchards and tuna landed. Included are the shipments into California during the year; the production of canned, cured, and manufactured fishery products (including meal and oil); production of liver oil; and a list of canning and sardine reduction plants operating in 1949.

Contribucion al Estudio de los Escombridos de la Costa Vasca (Atun, Bonitos y Melva)--Contribution to the Study of the Scombroid Fish of the Basque Coast (Bluefin Tuna, Skipjack, and Frigate Mackerel)--by Jose Maria Navaz, Publicaciones Numero VIII, 21 p., illus., printed. Sociedad de Oceanografia de Guipuzcoa, San Sebastian, Spain, 1950. Contains observations on the tuna catch and fishing methods for the Spanish port of San Sebastian on the Bay of Biscay. Includes biometric data on 100 Bluefin tuna, 50 albacore tuna, 32 skipjack tuna, and 2 frigate mackerel.

Customs Information for Exporters to the United States, 93 p., printed, 25 cents. Bureau of Customs, Treasury Department, Washington, D.C., 1950. (For sale by Superintendent of Documents, Washington 25, D. C.). This booklet is for the information and assistance of those who plan to export to the United States and for importers in the United States. The procedures and requirements for exporting to the United States are outlined in this publication. Such subjects are covered as clearance of goods through Customs, packing of goods, conversion of currency, invoices for Customs purposes, temporary free importation under bond, foreign trade zones, import quotas, etc. A list of Customs Collection Districts, Headquarters Ports, and Ports of Entry is included.

Doing Business with Austria, 4 p., processed, free. Business Information Service, Office of International Trade, Department of Commerce, Washington, D. C. Issued as an aid to business men interested in exploring the possibilities of expanding or initiating trade with Austria. Discusses Austrian foreign trade procedures and possibilities; exchange controls and capital movements; travel to Austria; Austrian fairs; and exchange rates. Also gives a list of sources for information and assistance.

Doing Business with Germany, (Revision of April 1950), 7 p., processed, free. Office of International Trade, Department of Commerce, Washington, D. C. This report covers the western and the Soviet zones of Germany and the western and Soviet sectors of Berlin. Discusses in general terms the German export and import procedures and regulations; other types of business transactions; pricing and exchange rates; samples; German representation of U. S. firms and U. S. Representation of German firms; special contract provisions; business visits to Germany and visits of German businessmen to the U. S.; and foreign exchange control and movements.

The Effect of Fishing on Stocks of Halibut in the Pacific, by William Francis Thompson, 60 p., printed, illus. University of Washington Press, Seattle, Wash., 1950. An analysis of the halibut fishery in the Pacific from 1925 up to 1945. Contains statistics of the fishery showing the reciprocal relationship between amount of gear and the catch per set and the changes in accumulated stock. It discusses the concept of a limited normal yield, and the theory of the accumulated stock as a resilient buffer mechanism and its modification of the limit to the normal yield. In addition, it presents statistics of the Western and Southern Areas and changes in the yield in each; evaluates the term "Catch per Set of Gear" and its related terms; and considers the biological significance of limited productivity of accumulated stocks and of the resilience of the species as related to the history of the virgin and fished stocks of halibut.

Fishery Resources of the U.S.S.R.--Significance in the Soviet Economy, by Eugenie Boutanovsky, International Reference Service, vol. VII, no. 22, May 1950, 15 p., processed, 10 cents. Office of International Trade, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, Washington 25, D. C., or Department of Commerce Field Offices). This is a summary of available data on the Russian fisheries. Most of the statistics on production are for 1933 and 1934. A discussion of the various fisheries is presented by areas or basins, together with a short summary of the current five-year plan, fish processing, fishery byproducts, shipbuilding, fishing nets, shipping containers, refrigeration, and foreign trade.

"The 'Gloucester' Dragger Fleet," article, Trade News, May 1950, vol. 2, no. 11, pp. 10-2, illus., processed. Department of Fisheries, Ottawa, Canada. During the past few years, a new offshore fishery has been developed on the Canadian Atlantic Coast. Operating from Gloucester County in New Brunswick, particularly from the Caraquet region and Shippigan Island, a fleet of new small draggers has been exploiting the fertile grounds of the Gulf of St. Lawrence. This is a report on this fleet and an analysis of the operations of this fleet. Included is a comparison of fresh-fishing operations from April 1947 to March 1949 by Canadian east coast offshore craft, including "Gloucester" draggers, Atlantic draggers, and schooners, and all other Canadian offshore craft.

An International Index of Films on the Conservation and Utilization of Resources (Prepared for the United Nations Scientific Conference on the Con-

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servation and Utilization of Resources, August-September 1949, under direction of the United Nations Film Board), 175 p., illus., processed. United Nations, Lake Success, N. Y., 1950. This is a catalog of films in the resource fields available to persons and agencies throughout the world, and includes a listing of films on fisheries.

Miscellaneous Fish and Wildlife Bills (Hearings before the Subcommittee on the Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-First Congress, Second Session, on H. R. 230, to promote effectual utilization of the fishery resources of the United States; H. R. 2648, to establish the "Fish and Wildlife Advisory Board;" H. R. 6533, to provide that the United States aid States in fish restoration and management projects; H.RR. 6973, to authorize a continuing study of the croaker and other fish in Chesapeake Bay and tributaries; H. R. 7209, to authorize a continuing study of white shad, herring, and other fish in the Albemarle and Pamlico Sounds and tributaries; H. R. 7887 to grant approval of Congress to an amendment to the Atlantic States Marine Fisheries Compact, and repealing the limitation on the life of such compact; and other bills), 144 p., printed. Available only from the House Committee on Merchant Marine and Fisheries until exhausted. Contains statements, information, and reports on these bills presented at the hearings held February 14, March 16, April 25-26, and May 11, 1950.

Nova Scotia Fisheries Yearbook 1948-1949, 92, p., illus., processed. Fisheries Division, Nova Scotia Department of Trade and Industry, Halifax, Nava Scotia, Canada, 1950. Contains data on production of fishery products, including landed values, by county and by species and months (for 1948). For each county, the following statistics (mostly for 1946) are given: number of vessels by size and type of fishery; number of fishermen by type of vessel and fishery; number and type of nets and gear; fishing bounties paid; employment in processing establishments; fishermen's loans; a list of fish plants and canneries (1948); and a list of fisheries inspectors.

"The Pismo Clam," by John E. Fitch, article, California Fish and Game, July 1950. vol. 36, no. 3, pp. 285-312, illus., printed. Division of Fish and Game, California Department of Natural Resources, San Francisco, Calif. A popular account of what is known about the pismo clam (Tivela stultorum Mawe). Some of the information contained in this article has been published previously while much of it is presented for the first time. Discusses fishing methods, preparation, management, anatomy, feeding habits, growth, reproduction, and mortality.

Proceedings of the Gulf and Caribbean Fisheries Institute, Second Annual Session, Miami Beach, November 1949, 132 p., printed, $2.00. The Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, Coral Gables, Florida, March 1950. Contains all of the papers presented at the second annual session of the Institute. Papers were presented on the oyster fisheries, Caribbean fisheries, Gulf fisheries, and fisheries economics. A summary of the proceedings, the 1947 population of the territories in the Gulf and Caribbean area, and a list of cooperating and participating organizations are also included.

Proceedings of the United Nations Scientific Conference on the Conservation and Utilization of Resources (17 August--6 September 1949, Lake Success, New York), Volume 1, Plenary Meetings, 431 p., in English and French, printed, illus. United Nations, Lake Success, New York, tentative price $4.50. This is the first volume of the Proceedings of the United Nations Scientific Conference on the Conservation and Utilization of Resources, which brought together over 700 scientists from 50 countries to consider more than 500 scientific papers. This volume contains background and objectives of the Conference; preparatory work; officers, contributors, participants and secretariat; and detailed proceedings of the plenary meetings. The entire series will consist of eight volumes. Volume VII will be on wildlife and fish resources (275 pages, approximately $3.00) and will contain all the papers presented on fisheries. Volume VIII is an index to the series (100 pages, approximately $1.50). These last two volumes have not been issued as yet.

United States Participation in the United Nations, Department of State Publication, International Conference and Organization Series III, 48, 254 p., printed, 50 cents. Department of State, Washington, D. C., May 1950. (For sale by the Superintendent of Documents, Washington 25, D. C.). Report by the President to the Congress for the year 1949 on the activities of the United Nations and the participation of the United States therein. Among the many phases covered by this report are technical aid and fishery production, fishery statistics, international trade and tariffs, devaluation, the International Commodity Clearing House, and the Food and Agriculture Organization.

"Wages and Working Conditions in the Edible Animal Products Industry, October 1948," article, The Labour Gazette, November 1949, vol. XLIX, no. 11, pp. 1445-61, printed, 10 cents per issue. Canadian Department of Labour, Ottawa, Canada. Prepared from data obtained in the general annual survey of wage rates and hours of labor for 1948 made by the Canadian Department of Labor, this article deals with three branches of the industry, (1) Dairy products, (2) meat products, and (3) fish canning and packing. The latter section deals with collective agreements, wage rates on the West Coast, stantard weekly hours of work, overtime rates of pay, vacations with pay, statutory holidays, and sick leave with pay. In analyzing this industry, which consists mainly of salmon canning on the Canadian west coast and canning or packing a variety of fish on the East Coast, returns from 31 establishments (2,200 workers) in the Maritime Provinces and 52 establishments (3,400 workers) in British Columbia were used.

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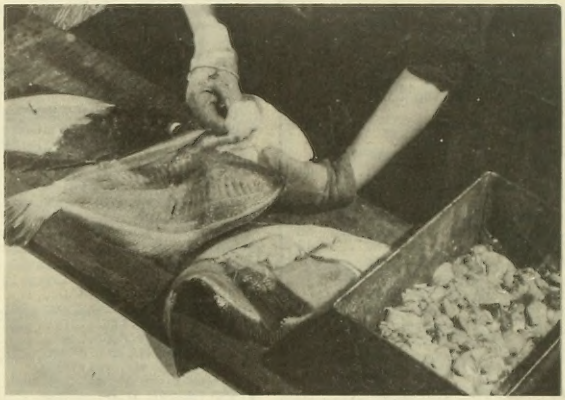
UTILIZATION OF FISHERY BYPRODUCTS IN WASHINGTON AND OR...

The status of the fishery byproducts industry in Washington and Oregon is discussed in Fishery Leaflet 370, Utilization of Fishery By-Products in Washington and Oregon.

This 24-page publication describes the utilization of the fish waste which is utilized as whole waste or is separated into its various components and selected portions utilized. The whole waste is used in fish hatcheries, on fur farms, in pet food, and in reduction plants. The selected portions used are the skins, eggs, and livers and viscera. The skins are processed for manufacture into leather for women's shoes; the eggs are made into caviar and fish bait; and the livers and viscera are rendered for oil and vitamin A.

Various producing areas in the two States are pointed out in this leaflet. It indicates that the most important in Washington are Puget Sound, Grays Harbor, Columbia River, and Willapa Harbor. In Oregon, the Astoria-Warrenton-Hammond area is the center of greatest production; also important are Yaquina Bay, Coos Bay, and Tillamook Bay.



Free copies of Fishery Leaflet 370 are available upon request from the Division of Information, U. S. Fish and Wildlife Service, Washington, D. C.

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