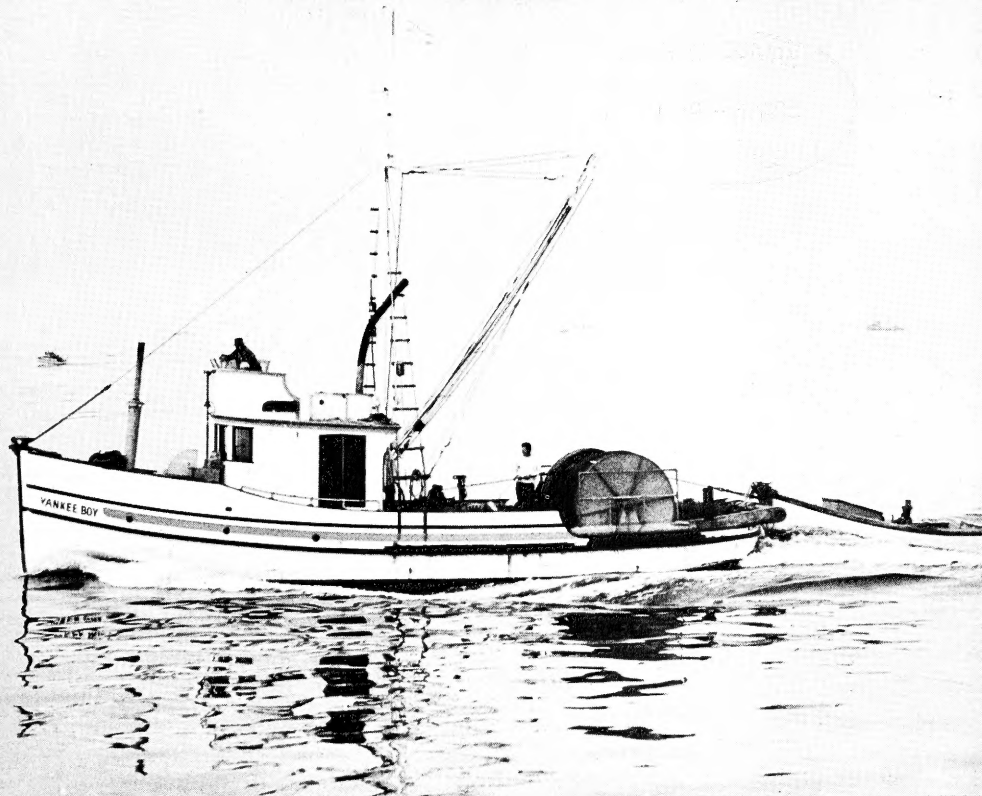


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prepared in the BRANCH OF COMMERCIAL FISHERIES

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DRUM SEINING--A NEW DEVELOPMENT IN THE PUGET SOUND SALMON FISHERY

By Keith A. Smith*

DRUM SEINING INTRODUCED

A new type purse-seine vessel has appeared in the Puget Sound, Washington, salmon fishery. In place of the conventional turntable, this vessel uses a large drum or reel mounted on the stern for setting, rewinding, and carrying the purse seine. Although one such drum seiner has been fishing out of Bellingham for several years, the first general trend toward the use of this new method became noticeable at the start of the 1953 season at which time 11 other seiners had been converted to this type of gear.

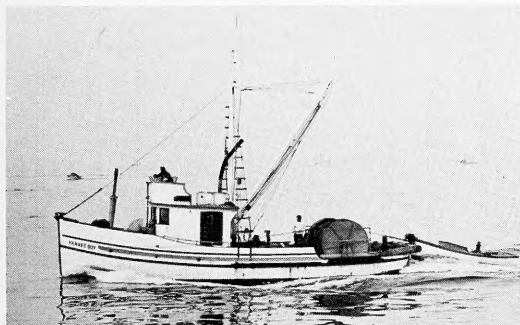


FIG. 1 - DRUM SEINER ON BOUNDARY BAY, PUGET SOUND.

The system originated in Canada, where a number of British Columbia fishermen have been operating drum-seine boats successfully for several years.

Doubts were expressed at the beginning of the 1953 season by some fishermen as to the ability of drum seiners to catch sufficient numbers of salmon, especially in deep water and tide rips. A number of problems in operating the new gear were encountered at first, but results indicate that most of the drum seiners had a successful season. Statistics collected for July 1953, in the Point Roberts-Boundary Bay area where most of these boats fished, show an average catch of 317 salmon per boat per day for the drum seiners as compared with 219 salmon per boat per day for the conventional seiners. According to a reliable report, a drum seiner was high boat for the season in this area.

As a result of this excellent showing, many additional purse seiners are expected to be converted to drum seining for the 1954 season. The Bellingham firm that performed the conversions on 10 of the 12 boats that operated in 1953 is reportedly swamped with orders. Some observers feel that a revolution in the purse-seine fleet is under way.

DESCRIPTION OF GEAR AND EQUIPMENT

The main unit of gear in this system is the drum or reel upon which the seine is wound. This drum is mounted on the stern of the vessel either above the deck or in a well that is built into the deck (figure 2). It is constructed of sheet steel and is designed to hold from 250 to 300 fathoms of purse seine. The drum is 6 to 8 feet in diameter and as long as the beam of the vessel will permit. The diameter of the core is about 10 inches.

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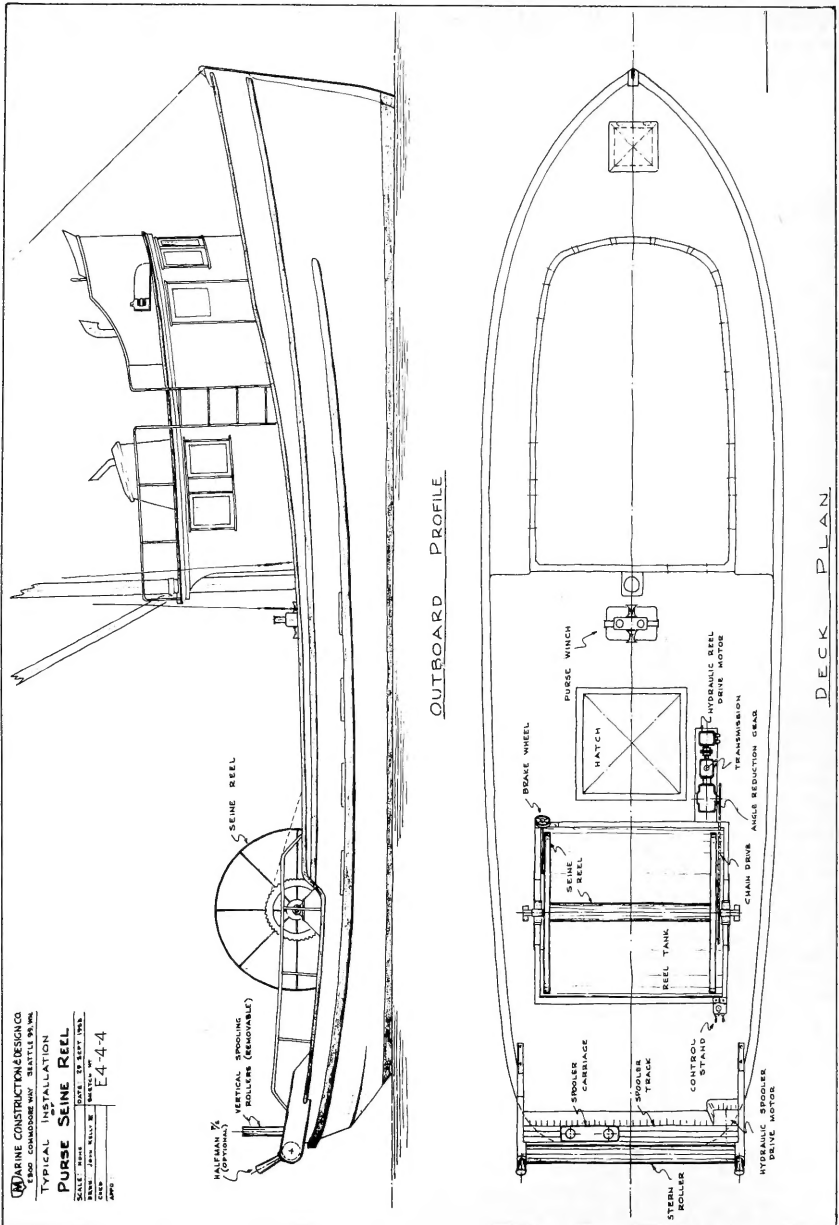


FIG. 2 - TYPICAL DRUM SEINER SHOWING ESSENTIAL COMPONENTS OF GEAR.

At the stern a roller is provided that is similar in design and function to the roller of the conventional seiner. It is free to turn with the seine as the seine is being set or hauled.

A spooler is provided for bunching the seine and winding it evenly on the drum as it is being hauled. This spooler consists of two vertical rollers, a carriage, and a

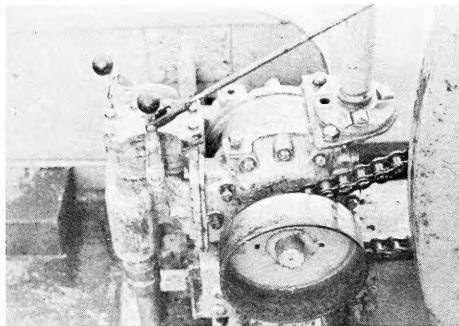


FIG. 3 - HYDRAULIC-DRIVE UNIT FURNISHING POWER FOR THE DRUM THROUGH A CHAIN AND SPROCKET; USED ON SOME DRUM SEINERS.

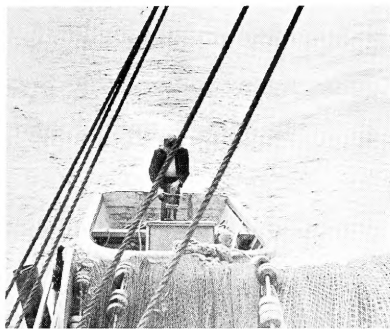


FIG. 4 - THE SKIFF IS TOWED PREPARATORY TO MAKING A SET.

carriage track. The rollers are about 6 inches in diameter, 30 inches high, and 15 inches apart. They are set in sockets in the carriage, which runs back and forth on the track across the stern of the vessel while the net is being reeled in. When the net is being set, the spoolers are removed from their sockets.

The drum is rotated by means of a mechanical or hydraulic system. In the mechanical system, power is taken either from the winch drive or directly from the main engine by means of gears and shafting to a truck transmission that is mounted just forward of the drum. The transmission provides for variation in speed and for reversing the rotation of the drum. It is coupled to a differential or angle reduction gear that drives the drum by means of a chain and sprocket. The hydraulic system utilizes a hydraulic pump mounted on the main engine and a hydraulic motor located near the drum. A gear transmission may or may not be used between the drum and the hydraulic motor (fig. 2 and 3). The spooler may be driven by means of a mechanical, hydraulic, or electrical system.

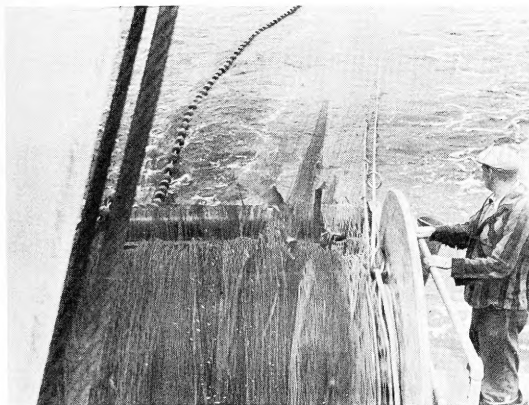
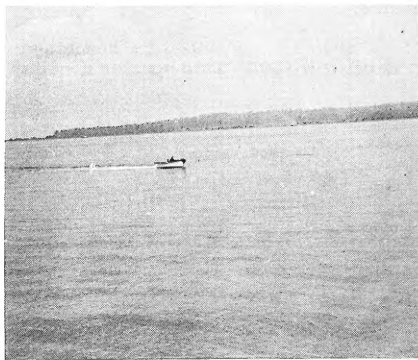
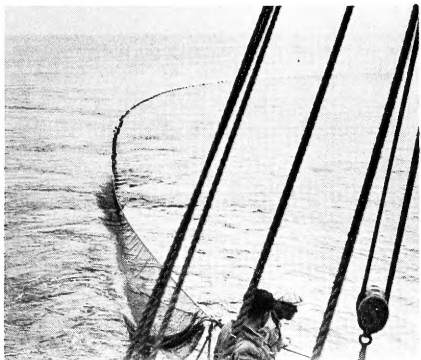


FIG. 5 - A SET IS STARTED AS THE SEINE UNWINDS RAPIDLY FROM THE DRUM. THE ROLLERS OF THE SPOOLER ARE REMOVED FROM THEIR SOCKETS WHILE THE SEINE IS BEING SET. ONE OF THESE ROLLERS CAN BE SEEN STOWED JUST BEHIND THE FISHERMAN'S RIGHT WRIST.

For use in drum seining, the seine must be hung so that the lead line is nearly the same length as the cork line. The common practice is to hang 11 fathoms of web to 10 fathoms of cork line

and $9\frac{1}{2}$ fathoms of lead line. Some fishermen feel that a completely "square" hanging, with lead lines and cork lines of equal length, would be even better. If the lead line is



FIGS. 6 AND 7 - THE SEINE IS TOWED BY THE BOAT AND SKIFF BEFORE IT IS CLOSED AND PURSED.

$1/10$ shorter than the cork line, as in the conventional seine, excessive strain is put on the lead line when it is being set or hauled, which may cause it to part. The seines for drum operation are 250 to 300 fathoms long, and are made up of 3 strips of $4\frac{1}{4}$ -inch mesh (stretched measure) of cotton webbing, each strip 100 meshes deep.

ADVANTAGES OF DRUM SEINING

The chief advantages of this gear are that it reduces the number of crew members required to operate the boat; it allows a set to be made in much less time; and it hauls the net by power so that much less labor is required by the fishermen. A crew of 5 men is used on the drum seiner as compared with a crew of 9 on the conventional type seiner. Since fishing is done on a share basis, this means each fisherman and the boat

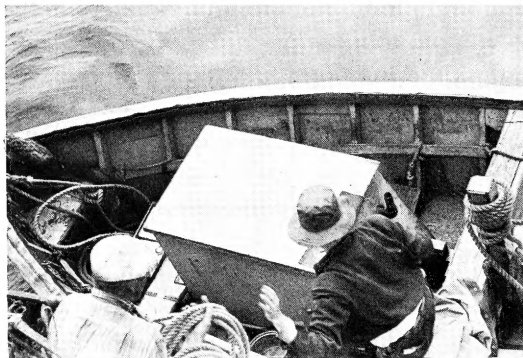


FIG. 8 - THE RUNNING LINE IS PASSED FROM THE SKIFF TO THE BOAT.



FIG. 9 - THE SKIFF TOWS THE VESSEL AWAY FROM THE SEINE DURING PURSING AND HAULING

owner receives a proportionally larger share. Individual sets are completed in as little as 40 minutes, making possible up to 20 sets per day, a great increase over the 8 to 10 per day possible with conventional gear. These two factors can, of course, result in more money for the drum-seine crews and operators. In addition, the work is easier.

Instead of 7 or 8 fishermen pulling 250 or more fathoms of seine out of the water and stacking it on the turntable each time a set is completed, one man operates two levers

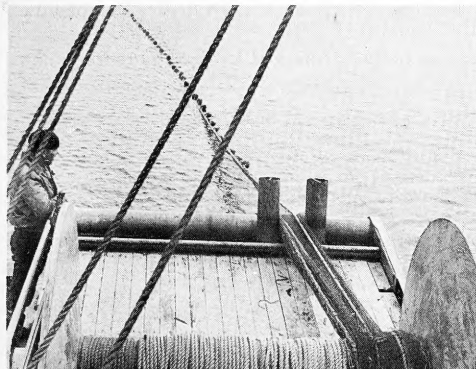


FIG. 10 - PURSING AND HAULING OF THE SEINE ARE STARTED SIMULTANEOUSLY. THE FISHERMAN AT THE LEFT CONTROLS THE ACTION OF THE DRUM AND THE LEVEL-WIND SPOOLER, BOTH OF WHICH ARE GEARED TO THE MAINE ENGINE ON THIS PARTICULAR VESSEL.



FIG. 11 - THE PURSE RINGS ARE DRAWN UP TO THE DAVIT.

controlling the rotation of the drum and the position of the spooler. Power from the main engine does all the work of rolling up the seine in proper order for making a new set. The fishermen are not so exhausted after a day of fishing.

Another advantage of drum seiners, or at least those with wells, is that the seine can be easily treated with salt or bluestone solution by filling the well with the solution and rotating the net in it.

METHOD OF OPERATION

The setting and hauling of the seine, similar in many respects to conventional purse seining, is as follows:

1. The fishing area is searched, with the seine skiff in tow. The fish-bag end of the seine is secured to the skiff (fig. 4).
2. When fish are located, the skiff is released, the net starts to unwind from the drum (fig. 5).
3. The seine is paid out in nearly a straight line until most of the net is in the water. It is then towed into a U shape by the skiff and the vessel running parallel courses into the tidal flow or toward the area where the fish are believed to be. The net is towed for several minutes in this manner before it is closed (fig. 6 and 7).
4. The net is closed and the running line and purse line are passed from the skiff to the boat (fig. 8). The skiff is then taken around to the opposite side of the boat and is used to tow the boat away from the seine. (This towing is done to prevent the seine from bunching up under the boat and possibly becoming fouled in the propeller.) (fig. 9)
5. The bunt end of the net is pursed, and the wing end of the net is started onto the drum immediately after the circle is closed (fig. 10).
6. Pursing is continued until the purse rings are drawn up to the davit at which time they are threaded onto a device called a "clothespin" and are then hoisted to deck level (fig. 11 and 12).

7. Reeling in the seine is continued, with the seine coming in over the stern and the purse rings being pulled off the clothespin by their bridles (fig. 13).
8. As on the conventional seiners, the fish are either brailed or are dumped on deck as the fish-bag end is pulled aboard.
9. The remainder of the net is rolled up on the drum and is now ready for a new set.

CONVERSION OF VESSELS FOR DRUM SEINING

Not all purse seiners can be converted to drum seining. The vessel must be of suitable design. In converting a seiner to drum operation, the first factor which the owner must consider is stability. If the beam is broad enough and the boat stable enough, the reel may be mounted above deck. If not, a well must be built in the after-



FIG. 12 - THE "PURSE RINGS ARE THREADED ONTO THE CLOTHESPIN" AND HOISTED INTO POSITION AT DECK LEVEL.

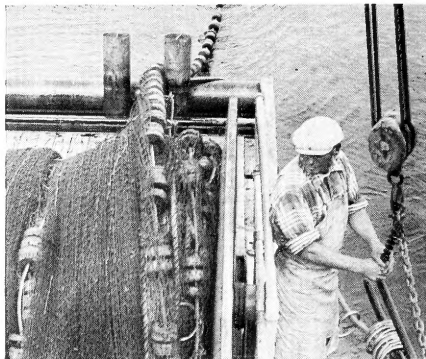


FIG. 13 - THE PURSE RINGS ARE PULLED OFF THE CLOTHESPIN BY THEIR BRIDLES, ONE BY ONE, AND GO BACK OVER THE ROLLER AND ON TO THE DRUM ALONG WITH THE PURSE LINE AND THE OTHER PARTS OF THE SEINE.

deck. The drum is installed in this well so that about one-third of the diameter of the reel is below the deck level, thus lowering the center of gravity. When the well is installed, adequate provision must be made for strengthening the deck. Otherwise, the vessel might be greatly weakened, since it is necessary to cut the deck open almost from gunwale to gunwale.

It is quite possible that in the near future new purse seiners will be designed and built especially for drum seining. It appears, however, that most of those in operation next year will be converted from the conventional purse-seine type. As in all new developments, the first models have had numerous sources of trouble which needed to be worked out. Many of the problems have been solved, others will be also as more experience with the method is gained. For use in other fisheries which require that the seine net be quickly set in a complete circle, two possible improvements have been suggested: (1) a swivel arrangement on the entire drum installation, or (2) the use of a vertical drum in place of the horizontal drum. The drum seiner of the future will undoubtedly have many improvements over the present, and should gradually evolve into an even more efficient unit.



VITAMIN CONTENT OF FISHERY BYPRODUCTS

Part 1 - Effect of Processing Methods on Riboflavin, Nicotinic Acid, and Vitamin B₁₂ Content of Solubles and Meal

By N. L. Karrick* and M. E. Stansby**

INTRODUCTION

Fish meal and condensed fish solubles, in addition to their content of high-quality protein, contain a number of vitamins which add materially to their nutritive value. Very little has been known either about the losses of such vitamins in the manufacture of these products or about the relative distribution of the vitamins between the meal and the solubles. The authors have investigated such losses and the distribution of riboflavin, nicotinic acid, and vitamin B₁₂ in the manufacture of California pilchard meal.

SAMPLING PROCEDURES

Samples of press cake, of the meal prepared from this press cake, and of stick-water from the press were obtained from three reduction plants. On the days when samples were taken these plants were operating as follows: Plant A was drying pilchard and mackerel canning scrap in a direct flame dryer. Plant B was drying whole pilchard in an indirect flame dryer at approximately 250° F. Plant C was using pilchard scrap and drying the meal in an air-lift dryer at approximately 175° F.

Five samples each of press cake, meal, and stickwater were taken during one day's run at each plant. Since it is difficult to be certain just how representative a given sample may be of the material flowing through a plant during a day's operation, the five samples of each product were taken in order to check on the variation during a day's run.

All samples were stored at 0° F. until the analyses were made. The meals were ground in a "Labconco" laboratory mill before analysis.

ASSAY METHODS

The vitamin content of the products was determined by microbiological assays. A modification of the method of Roberts and Snell (1946) was used for the riboflavin and the nicotinic acid assays. Vitamin B₁₂ was determined by a modification of the method of Hoffmann, Stokstad, Hutchins, Dornbush, and Jukes (1949).

Riboflavin and nicotinic acid were extracted by incubating 1-gram samples with papain and takadiastase in a pH 4.6 buffer at 37° C. Vitamin B₁₂ was extracted by autoclaving the sample in water at 15 pounds pressure for 5 minutes.

For all of the vitamin assays the samples were run in duplicate at 4 levels. The growth of the organism was measured by titration of the acid produced. Each sample was analyzed 6 to 10 times for each of the vitamins.

Oil and moisture content of the products was determined using standard technics of the A. O. A. C. (1950).

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DISCUSSION OF RESULTS

The five samples of press cake and meal taken from plant A were assayed separately to determine the variation during a day's run. There was significant but small variation in the moisture and fat content (table 1). The data indicate that the products during a day's run vary slightly but are fairly uniform from the standpoint of moisture and fat content.

Table 1--Variation in Moisture, Oil, and Vitamin Content of Press Cake and Meal During One Day's Operation

Plant Code	Type of Dryer	Raw Material	Processed Material	Sample	Composition of Sample				
					Moisture	Oil	Vitamins (moisture- and oil-free basis)		
							Riboflavin	Nicotinic Acid	B ₁₂
					Number ^{1/}	Percent	Percent	Micrograms Per Gram	Micrograms Per Gram
A	Direct flame dryer	Pilchard and mackerel canning scrap	Press cake	1	57.3	5.47	6.7	92	0.29
				2	54.5	5.48	6.2	88	0.32
				3	55.8	4.87	4.7	85	0.29
				4	57.0	6.48	2.8	93	0.37
				5	57.8	5.45	3.0	91	0.36
			Meal	1	8.9	9.21	4.5	71	0.34
				2	7.9	9.24	4.5	60	0.32
				3	8.2	8.06	4.5	65	0.26
				4	8.9	7.88	4.8	71	0.28
				5	8.0	8.48	4.3	62	0.25
C	Air-lift dryer (app. 175° F.)	Pilchard scrap	Meal	1	12.5	7.15	2.9	42	0.22
				2	13.4	7.09	2.4	44	0.23
				3	12.9	7.13	2.5	42	0.21
				4	14.1	6.94	2.8	43	0.23
				5	13.4	6.52	2.5	40	0.22

^{1/}EACH NUMBER REPRESENTS A SEPARATE SAMPLE TAKEN DURING THE COURSE OF A DAY'S OPERATION.

There was no significant variation in the nicotinic acid and vitamin B₁₂ content among the replicate samples of press cake and meal. The riboflavin content among the replicate samples of meal was uniform, but the riboflavin content of the press cake replicate samples showed considerable variation (table 1). Since the variability among samples from plant A was not great, samples from plant B, where similar processing technics were used, were not assayed separately but were composited. Meal samples from plant C, where different equipment was used, were assayed individually.

DRYING LOSSES: In the preparation of meal from pilchard and mackerel canning scrap in a direct flame dryer, whole pilchard in an indirect flame dryer, or pilchard scrap in an air-lift dryer, there was no significant loss of riboflavin and vitamin B₁₂ during the drying process from press cake to meal (table 2). There was also no loss

Table 2--Composition of Press Cake and of the Corresponding Meals in Different Types of Dryers

Plant Code	Type of Dryer	Raw Material	Processed Material	Composition of Sample ^{1/}				
				Moisture	Oil	Vitamins (moisture- and oil-free basis)		
						Riboflavin	Nicotinic Acid	B ₁₂
				Percent	Percent	Micrograms Per Gram	Micrograms Per Gram	Micrograms Per Gram
A	Direct flame dryer	Pilchard and mackerel canning scrap	Press cake	56.5	5.55	4.7	90	0.33
			Meal	8.4	8.57	4.5	66	0.29
B	Indirect flame dryer (app. 250° F.)	Whole pilchard	Press cake	53.6	4.80	3.8	82	0.23
			Meal	7.5	7.85	3.8	80	0.24
C	Air-lift dryer (app. 175° F.)	Pilchard scrap	Press cake	49.5	4.11	2.8	39	0.18
			Meal	13.3	6.96	2.6	42	0.22

^{1/}DATA FOR A PRESS CAKE AND MEAL, AND FOR C MEAL REPRESENT THE AVERAGE OF FIVE INDIVIDUAL SAMPLES TAKEN DURING THE COURSE OF ONE DAY'S OPERATION IN A PLANT. DATA FOR B PRESS CAKE AND MEAL, AND FOR C PRESS CAKE REPRESENT THE AVERAGE VALUES FOR COMPOSITE SAMPLES PREPARED BY COMBINING FIVE SAMPLES TAKEN DURING THE COURSE OF A DAY'S PLANT OPERATION.

of nicotinic acid in the pilchard meal prepared both in an air-lift dryer and an indirect flame dryer. However, there was a significant difference in nicotinic acid content between the press cake and the direct flame-dried meal. The nicotinic acid content of the press cake varied from 85 to 93 micrograms per gram on the dry basis and averaged 90, while that of the meal ranged from 60 to 71 and averaged 66. The average loss in nicotinic acid content amounted to 27 percent.

It has been quite generally believed that rather extensive losses of nutritive value occur when press cake is dried, especially in dryers of the direct-flame type. It is surprising to note, therefore, that neither vitamin B₁₂ nor riboflavin show any appreciable decrease when the press cake is processed in such a dryer.

VITAMIN DISTRIBUTION BETWEEN MEAL AND SOLUBLES: Some tests were carried out to show the distribution of the three vitamins between the meal and the solubles. The original raw material contains a certain quantity of each of the vitamins. At the pressing stage a portion of the vitamins are diverted into the stickwater, and these vitamins eventually appear in the condensed fish solubles. The remainder of the vitamins stay in the press cake and, aside from any losses in the dryer, end up in the finished meal. In order to calculate this distribution it is necessary to know the proportion of meal and solubles produced from a given quantity of raw material. For this purpose the ratio 400 pounds of meal to 165 pounds of solubles (50 percent solids) per ton of raw material were used. These figures were averages of values obtained from several operators of pilchard reduction plants.

In the analyses of the fish solubles used for the distribution calculations, all assays were made on the uncondensed fish solubles as they came from the press. These solubles contained about 5 percent solids and had yet to be concentrated to produce the condensed product. During this subsequent concentration some loss of vitamin content possibly occurs. It was impractical, however, to procure samples of the condensed fish solubles corresponding to the lots of meal prepared from the same raw material. The dilute solubles are stored in large tanks in which stickwater from several days' production is collected. Thus, any sample of condensed solubles would correspond to stickwater from several days' operations.

The distribution of vitamins between solubles and meal takes place at the pressing stage. Plants A and B employed the same type of press, whereas plant C used a different type. The meal manufactured at plant C contained a higher proportion of all three vitamins in the meal than did products from the other two plants. Therefore, it may be that the distribution of these vitamins between the meal and the solubles is affected by the manner of pressing.

Table 3--Distribution of Vitamins Between Solubles and Meal

Plant Code	Raw Material	Processed Material	Vitamins Derived From 1 Ton of Raw Fish					
			Riboflavin		Nicotinic Acid		Vitamin B ₁₂	
			Quantity	Proportion	Quantity	Proportion	Quantity	Proportion
		Micrograms	Percent	Micrograms	Percent	Micrograms	Percent	
A ¹ /	Pilchard and mackerel canning scrap	Solubles	880	56	25,500	72	57	57
		Meal	680	44	9,900	28	43	43
		Solubles and meal	1,560	100	35,400	100	100	100
B ² /	Whole pilchard	Solubles	740	56	28,500	70	89	71
		Meal	580	44	12,100	30	36	29
		Solubles and meal	1,320	100	40,600	100	125	100
C ³ /	Pilchard scrap	Solubles	300	45	9,100	60	24	43
		Meal	370	55	6,140	40	32	57
		Solubles and meal	670	100	15,240	100	56	100
Over-all average in solubles			640	52	21,000	67	57	57

¹PLANT A USED A FLAME DRYER AND STANDARD SCREW-TYPE PRESS.

²PLANT B USED A MODIFIED FLAME DRYER AND STANDARD SCREW-TYPE PRESS.

³PLANT C USED AN AIR-LIFT DRYER AND P. & E. TYPE PRESS. A ROUGH MEASURE OF THE VITAMIN CONTENT OF THE RAW MATERIAL PROCESSED IN PLANT C INDICATED THAT THIS RAW MATERIAL WAS MUCH LOWER IN THE CONTENT OF ALL 3 VITAMINS THAN THAT ENTERING OTHER PLANTS. THIS PROBABLY ACCOUNTS FOR THE MUCH LOWER VALUES FOUND FOR PRODUCTS FROM PLANT C RATHER THAN ANY DIFFERENCES DUE TO PROCESSING METHODS.

Riboflavin was about evenly distributed between the solubles and the meal (table 3). The proportion in the solubles ranged from 45 to 56 percent of the total with an average of 52 percent. About two-thirds of the nicotinic acid occurred in the solubles with a range of from 60 to 72 percent and with an average of 67 percent. The distribution of vitamin B₁₂ was quite variable, ranging from 43 to 71 percent.

Of the total amount of these three vitamins in the meal and the solubles, an overall average of 59 percent occurred in the solubles and 41 percent in the meals. In operations where the solubles are added back to the meal to produce a "whole meal," it should be possible to about double the content of these vitamins over the concentration occurring in regular meal.

ACKNOWLEDGEMENT

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LITERATURE CITED

- ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS
1950. OFFICIAL METHODS OF ANALYSIS. SEVENTH EDITION, A. O. A. C., P. O. BOX 540, BENJAMIN FRANKLIN STATION, WASHINGTON 4, D. C.
- HOFFMANN, C. E.; STOKSTAD, E. L. R.; HUTCHINS, B. L.; DORNBUSH, A. C.; AND JUKES, T. H.
1949. THE MICROBIOLOGICAL ASSAY OF VITAMIN B₁₂ WITH LACTOBACILLUS LEICHMANNII. JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 181, NO. 2 (DECEMBER), PP. 635-44.
- ROBERTS, E. C., AND SNELL, E. E.
1946. AN IMPROVED MEDIUM FOR MICROBIOLOGICAL ASSAYS WITH LACTOBACILLUS CASEI. JOURNAL OF BIOLOGICAL CHEMISTRY, VOL. 163, NO. 2 (MAY), PP. 499-509.



SHIPWORM FRITTERS--A DELICACY

"I firmly believe one of the finest dishes in all the world is a platter of fried shipworm fritters," says an employee of the Maryland Chesapeake Biological Laboratory. "They taste like a delicate combination of the best clams and oysters," he says. Two employees of the Laboratory have been making an extensive study of these destructive sea animals.

"The big problem in making the fritters," says the second employee, "is getting enough shipworms. We cut them out of wooden blocks that have been purposely exposed to the worms, and sometimes it's a pretty exhausting operation."

--The Compass, October 1953



Progress on Projects, January 1954

VITAMIN CONTENT AND NUTRITIVE VALUE OF FISHERY BYPRODUCTS: Information on the proximate composition and vitamin content of fish meals has been presented in these progress reports as the data became available. For comparative purposes, a summary of the data collected to date is presented in the following table. In the table, where possible, average results as well as the range of values are given.

Proximate Composition and Vitamin Content of Fish Meals								
Description of Samples		Proximate Composition				Vitamin Content (Moisture-and-Oil Free Basis)		
Meal	Number of Samples Analyzed	Value	Moisture	Protein	Oil	Riboflavin	Niacin	Vitamin B ₁₂
			Percent	Percent	Percent	Micrograms per Gram	Micrograms per Gram	Micrograms per Gram
Sardine	23	Average	8.0	60.4	7.9	5.4	86	0.27
		Maximum	10.6	69.4	10.8	7.2	125	0.38
		Minimum	3.5	55.6	6.7	4.2	61	0.20
Sardine	16	Average	8.2	-	7.5	4.1	63	0.25
		Maximum	13.3	-	8.6	5.6	80	0.29
		Minimum	3.5	-	6.7	2.4	42	0.22
Tuna	22	Average	6.9	62.7	9.8	7.2	152	0.33
		Maximum	14.4	67.2	15.7	8.3	201	0.41
		Minimum	3.2	52.5	7.1	4.2	67	0.22
Menhaden	24	Average	9.2	59	9.5	4.0	66	-
		Maximum	10.8	65.9	13.5	7.0	91	-
		Minimum	7.2	50.1	6.5	2.6	42	-
Whale loin	3	Average	7.7	-	16.9	10.6	128	0.079
Mackerel	4	Average	9.7	-	7.9	5.8	66	0.43
Anchovy	1	-	3.1	-	7.6	4.7	41	0.14
Crab	6	Average	8.8	30.1	2.9	7.9	37	-
		Maximum	10.7	34.1	3.8	9.8	40	-
		Minimum	7.2	27.2	2.3	0.9	36	-
Herring	4	Average	11.1	-	9.9	7.5	70	0.32

* * * * *

SULFIDE DISCOLORATION IN CANNED TUNA (Period covered--from July through December 1953): The purpose of this project is to determine why some batches of tuna tend to cause sulfide discoloration of the cans. A study is being made of the reaction mechanism whereby iron sulfide is formed during the canning of tuna and of the factors which favor the reaction. This work includes a study of the compounds acting as a source of sulfide sulfur in tuna and the effect of such conditions as pH and spoilage of the flesh on the sulfide discoloration of the cans.

In order to form black iron sulfide in cans of tuna, sulfide sulfur must come in contact with the iron of the can under conditions favorable for the chemical reaction to occur. Sulfur occurs in fresh fish in a form other than sulfide. It is present in such amino acids as cystine and methionine which make up a portion of the fish proteins. During

spoilage of fish, a part of the sulfur is converted to the sulfide form. If this fish were canned, the sulfide would be available for reacting with any exposed iron in the can. For such a reaction to take place, however, certain other conditions, e. g. the optimum pH, must be present.

The effect of condition of the fish upon sulfide discoloration is being investigated to determine whether the sulfide comes directly from the fresh fish protein or from the degradation products that form from the protein. Other factors which might be important to the reaction of sulfide with iron (e. g. the pH of the fish) are being studied. The effects of variations in the processing procedures are also being considered.

The results so far seem to indicate that:

1. The degree of spoilage of tuna used for canning is only a minor factor in can discoloration.
2. The amount of precooking of tuna has little effect on can discoloration.
3. There is some possibility that the pH of the tuna may play an important role in can discoloration. (This point is being further investigated.)
4. Sulfides are present in fresh tuna both in bound form and as free hydrogen sulfide, the amount increasing with spoilage.
5. Essentially all of the sulfur present in the form of sulfide in the fresh fish is driven off during the precook period. (This occurred even with fish that were given a much shorter precooking period than is normally practiced commercially.)
6. Sulfides are found in the canned product. (Since the fish packed into the cans were free of sulfide, the sulfides in the canned fish must have been formed during the final heat processing.)
7. The sulfides formed during the heat processing probably come from the high molecular weight protein fraction of the tuna meat.

* * * * *

CHEMICAL AND PHYSICAL PROPERTIES OF FISH AND SHELLFISH PROTEINS:

Additional data were obtained with frozen rockfish to obtain a comparison of the amount of drip produced from frozen fillets when cooked (1) after thawing and (2) while frozen. The tests were made during periodic intervals of frozen storage of the fillets so as to observe the effect of storage conditions on drip formation. The results are summarized in the following table:

Samples of Frozen Fillets		Loss in Weight			
		Thawed Fillets			Frozen Fillets
Species of Fish	Storage Time at 0° F.	As Drip Formed During Thawing	As Evaporation and Drip Formed During Cooking ^{1/}	Total	As Evaporation and Drip Formed During Cooking ^{1/}
		Percent	Percent	Percent	Percent
Rockfish	7	1.4	21.8	22.8	20.4
	29	2.2	22.8	25.0	19.8
	132	3.1	21.5	24.6	16.9
	213	1.6	17.5	19.1	11.2

NOTE: THE FRESH FILLETS SHOWED A 22.0 PERCENT LOSS (AS EVAPORATION AND DRIP) DURING COOKING (BAKED AT 350° F. FOR 23 MINUTES).
^{1/}FOR THE COOKING TESTS, THE SAMPLES WERE BAKED AT 350° F. FOR 23 MINUTES FOR THE THAWED FILLETS AND 33 MINUTES FOR THE FROZEN FILLETS.

(Seattle)

TECHNICAL NOTE NO. 29--EFFECT OF SALT ON THE STORAGE LIFE OF SALMON EGGS PRESERVED WITH SODIUM BISULFITE

INTRODUCTION

Research by the Service's Fishery Technological Laboratory at Seattle, Washington, and the U. S. Fish and Wildlife Service hatchery at Leavenworth, Washington, has shown that salmon eggs are an excellent feed for hatchery fish (Robinson, Palmer, and Burrows 1951). Large quantities of these eggs are available each year in Alaska during the short but highly intensive canning season. How to preserve the eggs until they can be delivered to the hatchery is a problem. The best method would be to freeze them, but most Alaskan canneries do not have the required facilities.

A promising alternative method would be to preserve the eggs by means of a chemical. This method would have definite advantages. For instance, the expense of freezing and cold storage would be eliminated. Furthermore, any cost of transporting the eggs from Alaska would be reduced, since the cost of transportation is considerably lower for unfrozen than for frozen products. The price of the chemical, technical-grade sodium bisulfite (NaHSO_3), used to preserve the eggs is not high. It costs only 0.1 cent per pound of eggs preserved if used at the 0.5-percent level (0.5 pounds of sodium bisulfite per 99.5 pounds of eggs).

In work reported by Pigott and Stansby (1952), the use of 0.5-percent sodium bisulfite proved successful in preserving salmon eggs for approximately three months. In conjunction with this work, feeding tests were carried out at the Leavenworth Hatchery (Burrows, Robinson, and Palmer 1952) using eggs preserved by 0.5-percent sodium bisulfite. These tests showed no adverse effect from sodium bisulfite, except that it destroyed thiamine.

During the summer of 1951 a large-scale collection of salmon waste was made at a cannery in Petersburg, Alaska (Landgraf, Miyauchi, and Stansby 1951). At that time 5,000 pounds of salmon eggs were preserved in 30-pound slip-cover berry tins with 0.5-percent sodium bisulfite. These eggs were then shipped to the fish hatchery at Leavenworth, Washington. Upon arrival they were found to be spoiled.

The only known explanation for the spoilage was that the slight amount of salt (sodium chloride, NaCl) picked up by the eggs when they were flumed with sea water at the cannery may have accelerated the rate of decomposition. The reason for believing that salt may have contributed to the spoilage was that in earlier tests at the Seattle Technological Laboratory it was qualitatively observed that salt did decrease the preservative effect of sodium bisulfite.

In order to obtain quantitative data on how much the presence of salt affects the action of sodium bisulfite in the preservation of salmon eggs, the following experiment was run.

PROCEDURE

Salmon eggs were collected at Ketchikan, Alaska, from a cannery where fresh water was used for fluming the salmon waste to conveyor belts. A mixture of eggs from mature chum salmon (*Oncorhynchus keta*) and pink salmon (*Oncorhynchus gorbuscha*) were used. Chum salmon eggs made up approximately 80 percent of the total. The eggs were picked directly from a conveyor that carried the salmon waste from the "iron chinks" (machine for removing waste portions from salmon) to the gurry bins. After the eggs were drained and placed in containers, they were brought to the Laboratory where two series of preserved salmon eggs were prepared.

In series I, an empty 30-pound berry tin was placed on a scale adjusted for the gross weight of tin, plus eggs and chemical. The preservative (sodium bisulfite) was weighed into a beaker. Then a portion was sprinkled from the beaker onto the bottom

of the tin. Next a scoop with a capacity of approximately 5 pounds was used to transfer the salmon eggs to the tin. After each scoop of eggs was added, a small amount of preservative was sprinkled in. When approximately 15 pounds of salmon eggs had been placed in the tin, the added sodium bisulfite was mixed in thoroughly. Finally, after the tin was filled with 30 pounds of eggs, the contents were again mixed.

Five of the tins thus prepared made up a "lot," and there were 4 lots in each of the 2 series. The only variable between the lots was the concentration of sodium bisulfite, which was as follows:

Lot Number	Concentration of Sodium Bisulfite	
	Percent	
IA	0.25	
IB	0.50	
IC	0.75	
ID	1.0	

Series II was identical to Series I with the exception that 2-percent salt was added in addition to the sodium bisulfite. The salt and sodium bisulfite were weighed into a beaker and mixed prior to being added to the salmon eggs.

Both series of preserved eggs were stored in an unheated building at the rear of the Laboratory at temperatures ranging from 35° F. to 60° F. and averaging 50° F.

One tin of eggs from each lot was inspected at the end of 2, 4, 7, 10, and 15 weeks for surface mold, odor, color, general condition, and free liquid. If spoilage was evident, the remaining tins in the lot were opened. Once a tin was inspected, its contents were discarded.

RESULTS

The storage life of the various lots of chemically preserved salmon eggs is given in the following table.

Lot Number	Amount of Sodium Bisulfite	Amount of Sodium Chloride	Storage Life
	Percent	Percent	Weeks
IA	0.25	0	2
IIA	0.25	2	2
IB	0.50	0	10
IIB	0.50	2	2
IC	0.75	0	15
IIC	0.75	2	greater than 15
ID	1.0	0	greater than 15
IID	1.0	2	greater than 15

NOTE: ALTHOUGH IIC, ID, AND IID WERE ALL IN ACCEPTABLE CONDITION AT THE END OF 15 WEEKS OF STORAGE, THERE WAS A MARKED DIFFERENCE IN THE APPEARANCE AND GENERAL CONDITION OF THE PRESERVED SALMON EGGS FROM THESE THREE LOTS. THEY WERE RATED IN THE ORDER IID, IIC, AND ID, WITH IID BEING THE BEST.

With 0.25-percent sodium bisulfite, there was no marked preservative action with or without the addition of 2-percent salt.

With 0.5-percent sodium bisulfite, there was definite preservative action. However, the presence of 2-percent salt with the 0.5-percent sodium bisulfite had an adverse effect on the keeping quality of the eggs. The eggs preserved with 0.5-percent sodium bisulfite had a much longer storage life (10 weeks) than did those preserved with 0.5-percent sodium bisulfite plus 2-percent salt (2 weeks). More free liquid was present in those tins to which the salt had been added. It was in this liquid that putrefaction was first evident.

With 0.75-percent or 1.0-percent sodium bisulfite, the presence of 2-percent salt had no adverse effect on the keeping qualities of the eggs. In fact, addition of salt with these concentrations of sodium bisulfite greatly reduced the amount of mold in the eggs at the top of the containers and tended to prevent the separation of the eggs from the skins.

Thus, the results of this experiment indicate the following:

1. With sodium bisulfite concentrations (0.25 percent) less than sufficient to preserve the eggs (0.25 percent), the addition of 2-percent salt does not appreciably affect their storage life.
2. With sodium bisulfite concentrations (0.5 percent) just sufficient to preserve the eggs, the addition of the salt (2 percent) decreases their storage life.
3. With concentrations somewhat greater (0.75 or 1.0 percent) than just sufficient to preserve the eggs, the addition of salt (2 percent) tends to increase their storage life and has a beneficial effect on their appearance and general condition.

DISCUSSION

The results of this experiment are based on the preservative action of sodium bisulfite and salt on only 1,200 pounds of salmon eggs taken during a single season from but one cannery. The findings in a similar experiment carried out under somewhat different conditions may vary from those reported here.

However, the results of this one experiment do indicate that salmon eggs can be preserved in breather-type containers by 0.75- to 1.0-percent sodium bisulfite plus 2-percent salt for as long as 15 weeks or more at an average temperature of 50° F. (Earlier work has shown that a much longer storage life may be expected if hermetically sealed containers are used.)

Since earlier work (Burrows, Robinson, and Palmer 1952) indicated that sodium bisulfite, even at the 0.5-percent level, will destroy thiamine, feeding tests should be made using eggs preserved with 0.75- to 1.0-percent sodium bisulfite (with and without 2-percent salt) and containing added supplements of thiamine to determine whether these amounts of preservatives are feasible for use with eggs fed to hatchery fish.

LITERATURE CITED

- BURROWS, R. E.; ROBINSON, L. A.; AND PALMER, D. D.
1952. SUMMARY OF FEEDING TRIALS ON UTILIZATION OF FISHERY PRODUCTS FOR FISH FOOD. U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. (IN PREPARATION).
- LANDGRAF, R. G., JR.; MIYAUCHI, D. T.; AND STANSBY, M. E.
1951. UTILIZATION OF ALASKA SALMON CANNERY WASTE AS A SOURCE OF FEED FOR HATCHERY FISH. U. S. FISH AND WILDLIFE SERVICE, COMMERCIAL FISHERIES REVIEW, VOL. 13, NO. 11A (NOVEMBER SUPPLEMENT), PP. 26-33.
- PIGOTT, G. AND STANSBY, M. E.
1952. CHEMICAL PRESERVATION OF SALMON EGGS FOR FISH HATCHERY FEED. U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. (IN PREPARATION).
- ROBINSON, L. A.; PALMER, D. D.; AND BURROWS, R. E.
1951. TESTS OF HATCHERY FOODS FOR BLUEBACK SALMON 1949. U. S. FISH AND WILDLIFE SERVICE, SPECIAL SCIENTIFIC REPORT: FISHERIES NO. 60.

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TRENDS AND DEVELOPMENTS

Additions to the Fleet of U. S. Fishing Vessels

A total of 56 vessels of 5 net tons and over received their first documents as fishing craft during October 1953--8 more than in October 1952. Louisiana led with 12 vessels, followed by Florida east coast and Texas with 9 vessels each.

Vessels Issued First Documents as Fishing Craft, October 1953 and Comparative Data

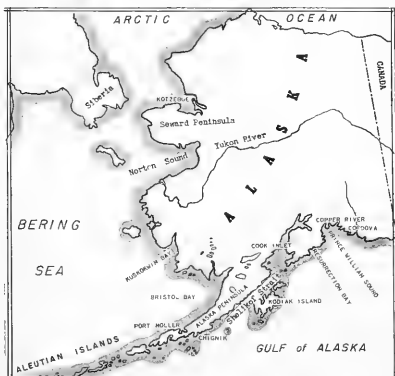
Section	October		January-October		Total 1952
	1953	1952	1953	1952	
	Number	Number	Number	Number	Number
New England	-	1	18	26	30
Middle Atlantic	1	1	17	23	26
Chesapeake	6	8	73	59	65
South Atlantic	10	11	89	75	89
Gulf	29	17	212	130	161
Pacific	5	3	153	195	203
Great Lakes	1	3	6	12	13
Alaska	3	4	49	86	88
Hawaii	1	-	3	-	-
Total	56	48	620	606	675

NOTE: VESSELS HAVE BEEN ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.



Alaska

COMMERCIAL POSSIBILITIES OF PREDATORY FRESH-WATER SPECIES: Possible commercial utilization of certain predatory fresh-water fish in the Bristol Bay area of Alaska is being explored by the Service's Branch of Fishery Biology in Juneau and the Fishery Products Laboratory at Ketchikan. Plans call for experimental netting of predatory fish in the Wood River and Nushagak River systems this winter. Gill nets of various sizes will be used as they were in studies the summer of 1953.



One purpose of the study is to determine if fish are available in the same numbers in winter as in summer. In the past summer, 1,046 fish were taken in experimental nets, the catch being composed of 98.5 percent charrs, 1.2 percent whitefish, 0.3 percent pike, and 0.1 percent rainbow trout. In studies this winter, a record was to be kept again of the number of fish taken, the area of capture, and other biological information, such as length, sex, and stomach contents.

In addition, fish were to be shipped to the Fishery Products Laboratory in Ketchikan for study of their commercial possibilities, including a market survey and a quality analysis.



California

KING (CHINOOK) SALMON RESEARCH: A recently completed controlled-flow experimental stream has advanced natural propagation studies of king (Chinook) salmon

at Mill Creek, California, being carried out by the Service's Branch of Fishery Biology in cooperation with the California Department of Fish and Game. The stream has been created in the old north fork of Mill Creek at Los Molinos, which has been dry until recent years brought high-water conditions. The channel has been deepened and the water flow controlled by a gate at the head of a 30-inch culvert through an earth-fill dam at the channel head.



EGG

1 DAY

30 DAYS



180 DAYS

KING SALMON (*ONCORHYNCHUS TSHAWYTSCHA*)

A study is being made of the early life history of king salmon. Experiments last year on egg survival in Mill Creek resulted in a severe egg loss because of extreme flood conditions. In present studies, plastic screen bags containing fertilized eggs were planted in November and will be periodically removed for comparison of survival conditions in Mill Creek and in the controlled-flow channel.

Through use of the control area, biologists hope to measure the influence of flooding and other factors on salmon production each year. Future studies will include experiments on spawning density, optimum ratio of male to female spawners, and other phases of the life history of king salmon.

* * * * *

GEAR FOR SAMPLING FISH ATTRACTED TO LIGHT TESTED BY "YELLOWFIN" (Cruises 53-Y-10 and 53-Y-11): Tests with two different type nets to develop a method of sampling fish attracted to a light were made by the California Department of Fish and Game's research vessel Yellowfin. On the first five-day cruise (53-Y-10), completed at Los Angeles on November 1, the vessel experimented off the California coast with a trap lift net similar to that described in Commercial Fisheries Review, August 1953 (pp. 14-17). This net was designed by the U. S. Fish and Wildlife Service's Branch of Exploratory Fishing and Gear Development Section, and proved successful on bait fishes in the Gulf of Mexico on tests aboard the Service's vessel Oregon.

This lift net was in a rigid box-like frame, $8\frac{1}{2}$ feet on a side. A light square frame was made to slide up and down the vertical supports of the heavy frame. The webbing for the sides and bottom of the net was of $\frac{3}{4}$ -inch stretched mesh, fastened at the top to the light sliding frame and at the bottom to the bottom netting. When using a light suspended above the surface of the water, the frame was placed in the water so that the top of the frame was just above the water. When using an underwater light the entire net was submerged to a depth of about 10 feet. After fish were attracted to the light, the light was turned off and the net was pulled by a line that led through a block to the sliding frame, thus, a wall of webbing was pulled around the fish.

Seventeen stations were occupied where attempts were made with a trap lift net to sample fish attracted to a light. In general the trap lift net worked better when used

with an underwater light. The greatest success was on anchovies; however, the anchovies milled in a large circle around the frame and seemed to avoid the net. Only occasionally would the anchovies come directly over the net and then only in sheltered waters where there was little or no motion. In even a small sea or swell the action of the frame kept the fish away. Also, when the ship rolled slightly operations were very difficult, the frame was cumbersome and dangerous to use, and the results were poor.

It became apparent that this particular type of gear would have to be modified for safe use in the open sea, and that its use for sampling would have to be restricted to sheltered areas. Therefore, it was decided to terminate the cruise early and work on a different type of gear.

On a 7-day cruise (53-Y-11) off Baja California, completed November 17, a blanket net was used at different water depths under different conditions and the results were generally successful.

The dimensions of the net were 50 by 60 feet. Leads were placed on one end of the net. This end was put into the water first. The entire net was then dropped into the water except for the end opposite the leads which was made fast to the vessel. The lead line was then lifted by two lines sheaved through blocks at the ends of two 50-foot outrigger poles. When the lead line came out of the water, the two wings were pulled, lifting the sides out of the water. The net was so hung that, when the sides of the net were suspended above the water, the bottom of the bag (of $\frac{3}{4}$ -inch stretched mesh) was approximately 5 fathoms below the surface of the water.

At some stations few fish were seen and few were captured. At others, fish were observed under the light but sea lions made them wild and difficult to capture. However, on each station where fish were seen a sample was obtained.

The best set of the cruise was inside the middle breakwater in Los Angeles Harbor where approximately 5,000 anchovies were caught. Several sets were made which yielded from a few hundred to about 1,000 sardines per set. One set yielded about 1,000 sauries. Atherinids were commonly taken up to approximately 2,000 per set. In addition to these fish, the following species were taken: California pompano (211 in one set), deep bodied anchovies (209 in one set), queenfish, jack mackerel, Pacific mackerel, squid, thread herring, round herring, barracuda (2 species), needlefish, flying fish (2 species), half moon, rock wrasse, and blacksmith. The last three species were taken during daylight off Cedros Island.

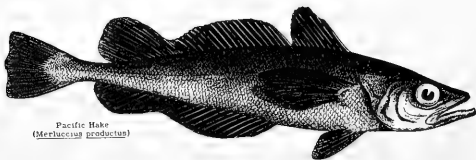
When there was a strong current the net worked better with the anchor up and the net on the windward side of the vessel. The net worked well in winds up to 30 miles per hour, and in moderate seas and swells. The net could be worked in shallow water or in deep water. Six men can make a set in about five minutes.

The net shows promise and with some modification following more experimentation it should prove to be a useful sampling tool, and a possible method of catching bait.

* * * * *

PACIFIC HAKE LARVAE STUDY: Pacific hake (*Merluccius productus*) larvae were the most abundant taken on extensive survey cruises of the agencies participating in the

California Cooperative Oceanic Fisheries Investigations. The South Pacific Fishery Investigations of the U. S. Fish and Wildlife Service is interested primarily in studying distribution and abundance of sardine spawning and survival of sardine larvae in relation to oceanographic conditions. The Pacific hake is one of the ecologically associated species about which information is also being collected.



Pacific Hake
(*Merluccius productus*)

Hake larvae have a widespread distribution, from Oregon to Cape San Lucas, Mexico, and offshore for at least 400 miles. The center of greatest abundance is off southern California and adjacent Baja California, between Pt. Concepcion and San Quintin Bay. About 98 percent of the hake larvae obtained each season have been collected during February, March, and April.

Although hake larvae are commonly taken in hauls containing sardine eggs and larvae, the two species do not appear to compete directly. Hake larvae are seldom taken above the 50-meter level while sardine larvae rarely occur that deep. Most hake larvae occur within a 5° temperature range, 10° C. to 15° C. (50° F. to 59° F.), with the optimum temperature about 13° C. (55° F.). Sardine eggs and larvae are usually taken in somewhat warmer water, 13° C. to 17° C. (55° F. to 63° F.), with the optimum temperature about 15° C. (59° F.).

The Pacific hake probably represents our largest latent fishery resources, for there is no commercial fishery for this species off the West Coast. The objection to Pacific hake as a market fish is because of the softness of its meat. However, related species of hake support important fisheries off the Atlantic Coast, Europe, South Africa, and Chile. A state permit has recently been issued to a California plant operator for experimental reduction of hake to fish meal and oil.



Cans--Shipments for Fishery Products, January-October 1953

Total shipments of metal cans for fish and sea food during January-October 1953 amounted to 91,365 short tons of steel (based on the amount of steel consumed in the manufacture of cans). Comparative data for 1952 are not available.

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS. REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF THE ARMY, NOVEMBER 1953: The Army Quartermaster Corps in November 1953 purchased 1,764,351 pounds (valued at \$839,868) of fresh and frozen fishery products for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force (see table). This was a decrease of 21.1 percent in quantity and 25.0 percent in value as compared with October purchases, and lower by 15.0 and 13.9 percent, respectively, when compared with a year ago.

Army Quartermaster Corps purchases of fresh and frozen fish during the first eleven months in 1953 totaled 25,407,537 pounds (valued at \$11,255,092), 18.5 percent lower in quantity and 12.0 percent less in value as compared with the similar period a year earlier.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (November and the First Eleven Months of 1953 and 1952)							
QUANTITY				VALUE			
November		January-November		November		January-November	
1953	1952	1953	1952	1953	1952	1953	1952
Lbs.	Lbs.	Lbs.	Lbs.	\$	\$	\$	\$
1,764,351	2,052,565	25,407,537	31,165,904	839,868	1,102,939	11,255,092	14,418,659

The over-all average price paid for fresh and frozen fishery products by the Department of the Army during November was 47.6 cents per pound, compared with 50.1 cents the previous month and 53.7 cents in November 1952.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make some local purchases which are not included in the above figures. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.



Maryland

PEMBROKE OYSTER BAR OPENED TO PUBLIC: Pembroke, one of the finest oyster growing bars in Maryland, was opened to public dredging on November 2, reports the November 1953 Maryland Tidwater News, a Maryland Department of Research and Education bulletin.

Some 14,000 bushels of oysters of excellent quality were harvested by the public dredging fleet during the first week of operations. About 40 typical, sail-powered dredge boats were engaged in the work of removing the oysters from the bed. Over 56,000 bushels of seed were planted on 220 acres of this big natural bar. Harvesting operations were to be stopped on November 13, or earlier, if the oyster population was overly thinned. The Commission of Tidewater Fisheries set this policy to assure that there be left on the bottom what they feel is sufficient brood stock for propagation purposes in 1954. As a part of the same policy, announcement has been made that fairly heavy shell plantings are to be made on Pembroke before the 1954 oyster spawning season.

The oysters being harvested were planted by the Commission in 1951; the seed were obtained mostly from the State's Punch Island seed area. The growth of the oysters was substantial and, it appears, natural mortality was relatively low.

In an attempt to make Pembroke a self-supporting and perpetually productive rock, the Commission of Tidewater Fisheries collected the 20-cent-per-bushel tax in strict accordance with the law, thus to provide funds to offset appropriations for oyster rehabilitation work. The oysters were selling at or over \$3.00 a bushel.



North Pacific Exploratory Fishery Program

FALL HERRING FISHERY PROSPECTS IN PRINCE WILLIAM SOUND REPORTED POOR BY "JOHN N. COBB" (Cruise 17): Herring in sufficient quantities for a commercial reduction fishery did not enter Prince William Sound, Alaska, during an October-November survey by the Service's exploratory fishing vessel John N. Cobb. The vessel commenced the cruise at Seattle, Washington, on October 12, 1953, and returned there on December 3, 1953.

Two significant schools of herring were located in Prince William Sound--one near the entrance of Port Fidalgo and the other near the entrance of Valdez Arm. Otherwise only small scattered schools were noted.

The primary purpose of the exploration was to ascertain if herring are sufficiently abundant in Prince William Sound during October and November to support a reduction fishery. To sample schools of herring, a mid-water trawl was used. Waters explored included the various bays, inlets, and channels of Prince William Sound and the bays and the coastline between Prince William Sound and Port Dick on the Kenai Peninsula.

Two branches of the U. S. Fish and Wildlife Service participated in this cruise: the Branch of Commercial Fisheries and the Branch of Fishery Biology.



Pacific Oceanic Fishery Investigations

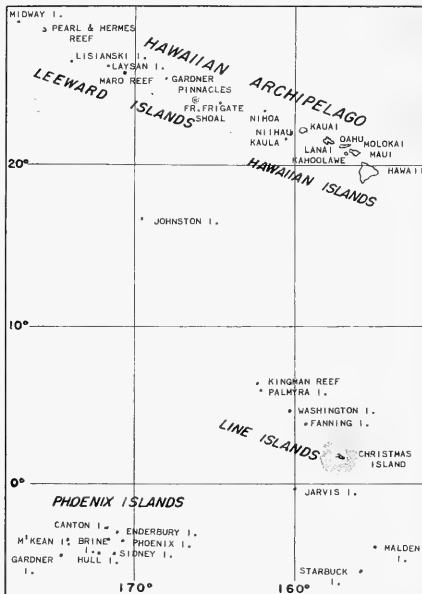
WINTER TUNA FISHERY POSSIBILITY OFF CHRISTMAS ISLAND REVEALED BY "JOHN R. MANNING" (Cruise 18): Good yellowfin tuna catches in December off

Christmas Island were made by the Service's research vessel John R. Manning on a cruise completed at Honolulu on December 19, 1953. This may open the possibility of a winter fishery for the Hawaiian fishing fleet. It was the first attempt by a Service research vessel to fish the equatorial waters south of Hawaii during December. A total of 14 days was spent fishing long lines for tuna en route to and in the immediate vicinity of Christmas Island. Fishing was particularly good near the island where the yellowfin tuna caught were the smaller sizes preferred by canners. A total of 5½ tons of yellowfin tuna were landed at a Honolulu cannery.

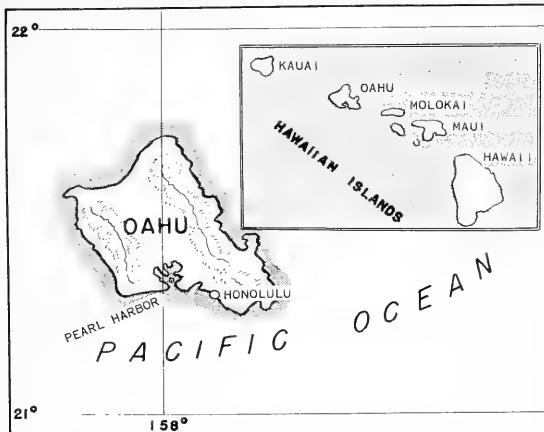
The vessel also brought back a party of scientists and fishermen who had spent two months on Christmas Island installing meteorological instruments and automatic sea-water temperature recorders on that equatorial atoll. Christmas Island is strategically located in the heart of the rich tuna fishing grounds recently found to the south of Hawaii, and the information recorded by the instruments installed there should be of great value in studying the environmental changes that affect the abundance of yellowfin tuna in equatorial waters. The newly discovered fishing grounds are beginning to attract the attention of mainland and Hawaii tuna fishermen, and the water temperature and weather data collected by POFT scientists will be used to predict the best seasons and areas for commercial fishing operations.

Setting up the recording thermometers involved the building of two steel towers on the reef, one on the windward and one on the leeward side of the island; and skin diving to anchor the sensitive elements in deep water off the face of the reef. Three Gilbertese residents were trained to tend the instruments and keep records. Meteorological instruments were loaned by the Honolulu office of the U. S. Weather Bureau, which will use the reports from this remote and isolated station to fill in its coverage of the general Central Pacific weather picture.

The field party also surveyed the lagoon of Christmas Island, one of the most extensive in the Pacific, for stocks of small fish suitable for use as live bait for tuna fishing. Little bait of this type was found, but there were plentiful supplies of larger mullet and milkfish (awa) that could be used for long-line (flag line) bait.



SKIPJACK TUNA ABUNDANCE AT SEASONAL LOW IN HAWAIIAN WATERS REPORTS THE "HUGH M. SMITH" (Cruise 24): The abundance of skipjack tuna (aku) in



Hawaiian Island waters had dropped to a seasonally-low winter level during the last week of a 30-day cruise of the Pacific Oceanic Fishery Investigations' research vessel Hugh M. Smith. The cruise, completed at Honolulu on December 1, included tests with tuna attractants and the collection of hydrographic data.

Scouting at the 13 regular stations resulted in seeing only 14 bird flocks, of which 2 were accompanying skipjack tuna, 2 dolphin (mahimahi), and the remaining 10 accompanied unidentified fish. The bird flocks were small in size, numbering less than 50 in all cases except one, and very loosely formed. The fishermen were highly doubtful

that any of the unidentified schools were skipjack. The greatest number of schools sighted on one day (2 skipjack tuna, 3 unidentified) was on the station approximately 30 miles south of Kaula Island. None was sighted in the area to the north and east of Oahu and birds also were found to be scarce.

An additional 10 flocks of "migrating birds" (not attending fish) were sighted at the two westernmost stations approximately 250 miles west and southwest of Oahu. Each of these flocks flew close to the water in a tight cluster and moved rapidly south-south-westerly at an estimated speed of 40 to 60 miles per hour. The birds were tentatively identified as a species of shearwater other than the commonly found wedge-tailed shearwater. In a half-day of scouting along the lee of Oahu close to Pearl Harbor, four small bird flocks were sighted, all of which appeared to be "working" over fish schools. In the vicinity of the flocks three skipjack sampans were actively fishing.

Six fish schools were approached and chummed with strips of agar prepared with an extract of skipjack meat and aluminum powder. No fish responded. Three of the schools were attended by few birds which were generally inactive, indicating that perhaps live bait would also have been unsuccessful in getting the fish to the surface; a better test of the material was possible on two skipjack tuna and a dolphin school which were at the surface when approached. The agar strips, however, failed to attract fish from these schools.

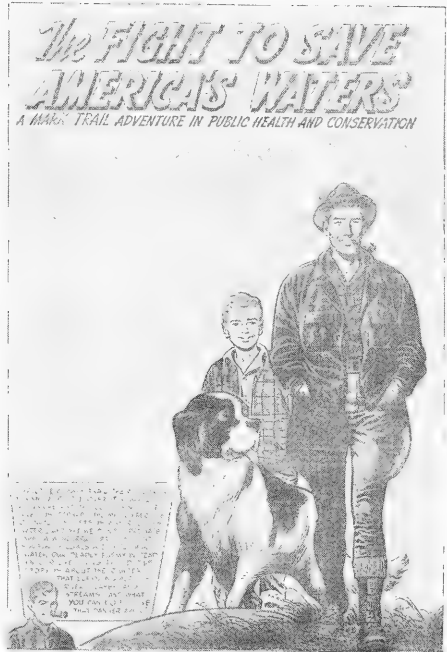


Pollution Control is Wildlife Week Theme

"Pollution Control" will be the theme of National Wildlife Week, March 21-27, 1954. The National Wildlife Federation, which sponsors the annual observance, recommends the creation of citizen committees to promote water pollution control.

The general purpose of National Wildlife Week is to get more people thinking about conservation, thereby creating a better informed and more active body of public opinion bearing on natural resource matters. The major specific objectives of the Federation relating to water pollution control are:

1. Promotion of adequate water pollution laws in every state. Some states have them, most do not. The standard is the model "State Water Pollution Control Act" which has been endorsed and recommended by the Council of State Governments.
2. Adequate appropriations for state pollution-control agencies. It doesn't take a lot. About 5 cents per person per year (based on total state population) will do the job.
3. Adequate sewage treatment facilities in every community. The cost here has been demonstrated in many cities: About 3 cents per family per day, over a period of years.
4. Adequate waste prevention or waste treatment by every industry. The solution here is simple and inexpensive for some industries; some have turned waste treatment into profit through byproducts. In other industries, the problem is difficult and costly; the consuming public must expect to pay slightly higher costs for certain products, the cost of protecting vital water resources. Still other industrial waste problems have not been solved; additional research is called for.
5. Prevention of silt pollution through soil conservation practices. Let's get behind the new national movement for soil conservation and flood-prevention through watershed treatment.



A CARTOONIST AND CONSERVATION CRUSADER (ED DODD OF ATLANTA, GEORGIA) PREPARED A COLOR COMIC BOOKLET. ILLUSTRATED ABOVE IS THE TITLE PAGE OF THE BOOKLET. (FOR DETAILS ON HOW TO OBTAIN THE BOOKLET IN QUANTITIES, WRITE NATIONAL WILDLIFE FEDERATION, 232 CARROLL STREET NW, TAKOMA PARK 12, D.C.)



U. S. Foreign Trade in Edible Fishery Products, September 1953

United States imports of fresh, frozen, and processed fish and shellfish during September 1953 totaled almost 60 million pounds (valued at \$16 million), reports the September 1953 United States Foreign Trade, a Department of Commerce publication (see table). This is an increase of 1 percent in quantity and 9 percent in value as compared with imports in September 1952.

Exports of processed fish and shellfish (excluding fresh and frozen) from the United States in September 1953 amounted to 5.6 million pounds (valued at \$1.2 million), 9 percent higher in quantity, but 8 percent lower in value than a year ago.

United States Foreign Trade in Edible Fishery Products, September 1953 With Comparisons						
	September 1953		September 1952		Year 1952	
	Quantity 1000 Lbs.	Value Million \$	Quantity 1000 Lbs.	Value Million \$	Quantity 1000 Lbs.	Value Million \$
Imports: Fish and shellfish: fresh, frozen, and processed ^{1/} /	59,636	16.1	58,856	14.7	705,118	183.1
Exports: Fish and shellfish: processed ^{1/} only (excluding fresh and frozen)	5,616	1.2	5,152	1.3	56,604	13.5

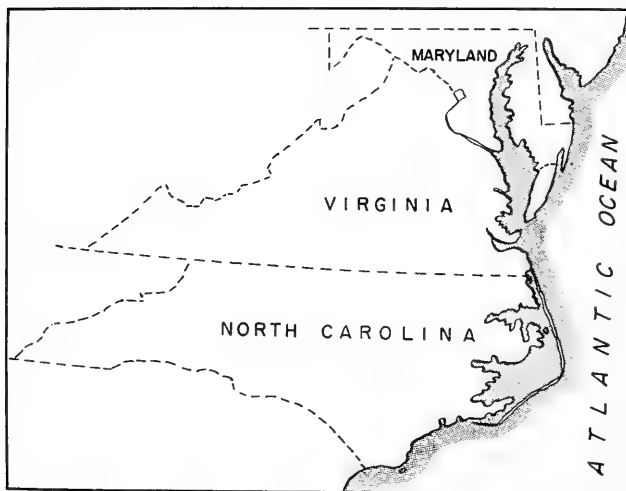
^{1/} INCLUDES PASTES, SAUCES, CLAM CHOWDER AND JUICE, AND OTHER SPECIALTIES.



Virginia

BROADER FISHERY RESEARCH RECOMMENDED: A broad research program for data to base sound fisheries management programs was recommended in December by

the Virginia Legislative Commission, reports the December 1953 *Maryland Tidewater News* of the Maryland Department of Research and Education. It was recommended that Virginia join Maryland and North Carolina in an extended program which will involve additional expenditures of \$122,074, approximately 50 percent to be borne by Virginia.



The Chairman of the Commission pointed out the need of expanding research in the area due to the failure of present policies of management-

ment to stem the tide of depletion in several important fisheries, especially sea trout, croaker, bluefish, butterfish, and scup or porgy.

The Commission listed five possible reasons for the decline in the major fisheries, as follows: (1) heavy fishing pressure; (2) poor spawning success; (3) destruction of young fish by gear operations, (4) hydrographic (temperature, currents, etc.) changes; (5) pollution.

The Commission made it clear that not all or even one of the five possible reasons cited can be evaluated soundly under present conditions of limited factual data. It urged

that since the fisheries are held in common by the three states, the study program should be implemented accordingly. Furthermore, its members indicate that with the maturity of the Tri-State program full consideration should be given to the salt-water sports fishery of the middle Atlantic area.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1953, P. 31.



Foreign Economic Policy Commission Reports to President

The Commission on Foreign Economic Policy--a special advisory commission constituted last August to shape a new foreign trade policy for the Eisenhower Administration--released its report to the President and the Congress on January 23, 1954. The 17-man Commission, headed by Clarence B. Randall, was composed of 10 members of the Senate and House and 7 nongovernment representatives.

In general, the report asked for less foreign aid and encouragement of more foreign trade, particularly imports. The report stated that the United States should take the leadership in a program to lower trade barriers; a program which also should be adopted by other nations. No specific commodities are mentioned in the report.

Significant statements in the report were to the effect that free trade is not possible under the conditions facing the United States today, and that although many United States tariffs are high and many of our customs procedures are slow and cumbersome, many other United States tariffs are low and more than half our imports enter free of duty.

The Commission points out: "Yet the nations of the free world would be stronger and more cohesive if many of the existing barriers to the exchange of their goods were reduced, if unnecessary uncertainties and delays created by such barriers were eliminated, and if adequate international arrangements for discussing and finding solutions to their common trade problems were developed and maintained."

The report discusses and makes recommendations on the postwar dollar problem, foreign aid and technical assistance, United States foreign investment, problems of agriculture and raw materials, United States dependence on imported materials, tariffs and trade policy, adjustment to increased imports, labor standards in international competition, related problems of trade adjustment, and currency convertibility. Concurrences or dissents to the Commission's recommendations which express significant differences are included as separate statements.

Some of the recommendations and comments of the Commission of interest to the fishery and allied industries follow:

1. Extend for three years the Reciprocal Trade Agreements Act with broader presidential powers under the Trade Agreements Act to enter into multilateral negotiations looking toward a reduction in tariff rates on a gradual basis. For the three years following renewal of the Act, the President should be authorized:
 - a. To reduce existing tariff rates by not more than 5 percent of present rates each year. (The President under the present law, expiring June 12, cannot prescribe reductions of more than 50 percent in the level of duties prevailing January 1, 1945, and this limit already has been reached in many cases.)
 - b. Based on information provided by the Tariff Commission, to reduce tariffs by not more than one-half of rates in effect January 1, 1945, on products which are not being imported or being imported in negligible volume, regardless of whether other countries make similar concessions.

NOTE: THE COMPLETE REPORT--COMMISSION ON FOREIGN ECONOMIC POLICY REPORT TO THE PRESIDENT AND THE CONGRESS, JANUARY 1954--IS AVAILABLE FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C., AT 35 CENTS A COPY.

- c. To reduce to 50 percent ad valorem, or its equivalent, any rate in excess of that ceiling, by stages over a period of three years.
2. Amend the "Buy American Act" and other acts containing the principle to permit the President to exempt bidders from other nations which treat our bidders on an equal basis with their own nationals.
3. Congress should direct and empower the President to have the Tariff Commission undertake a study of the tariff schedules immediately, with the purpose of framing proposals for the simplification of commodity definitions and rate structures and to proclaim such changes as he determines to be appropriate.
4. The Department of the Treasury should formulate proposals to simplify the problem of classifying articles not enumerated in our tariff schedules with the purpose of developing a single standard of classifications for the widest practicable application. They should also be directed to make a continuing study of difficulties and delays in customs administration and report to Congress annually.
5. The Senate should promptly consider H. R. 6584 now before it, to amend and improve the customs valuation provisions of our law by eliminating so-called "foreign value" as a basis of valuation and by other simplifying changes. In addition, the Department of the Treasury should be directed to study and report to Congress on the feasibility and effect of using actual invoice price of imported goods for valuation purposes and the feasibility of making more efficient use of the "anti-dumping" law.
6. The task of determining "that an industry in the United States is being or is likely to be injured. . . ." by foreign dumping should be transferred from the Department of the Treasury to the Tariff Commission.
7. The President should study appropriate methods to assure that United States industry is not injured by embargoes upon or other impediments to exports of raw materials to the United States for use in processing here. In this connection, he should direct the Department of the Treasury to review the effectiveness of existing countervailing duty provisions and consider alternative measures.
8. Our policy of nondiscrimination in trade matters, as reflected in our unconditional most-favored-nation policy, should not be changed.
9. The "escape clause" and "peril point" provisions and existing prenegotiation procedures should be retained. However, the statute should be amended to provide that the President is authorized to disregard findings under these provisions if the national interest requires it.
10. The same standards of sanitation and health should apply equally to domestic and imported goods.
11. Where workers are paid wages well below accepted standards in the exporting countries, "our negotiators should simply make clear that no tariff concessions will be granted on products made by workers receiving wages which are substandard in the exporting country. . . ." The United States should attempt to raise labor standards through consultative procedures and cooperation in international conferences such as those sponsored by the International Labor Organization. One of the essential strengths of our entire economy is the vitality and diversification of our industry. . . . In all of their variations they must pay wages generally in harmony with the general level of wages throughout the country. We would not want it otherwise, and we do not wish it to hap-

pen that the wage level in the classes (where machinery is a minor element and where the labor factor is the controlling element) should be determined or seriously affected by the wage levels abroad in competitive industries.

12. "In a free economy, some displacement of workers and some injury to institutions is unavoidable. It may come about through technological change, alterations in consumer preferences, exhaustion of a mineral resource, new inventions, new taxes, or many other causes. Since it has never been seriously proposed that the burden of all such injury arising in a free economy should be assumed by the Government, the Commission felt that it was not appropriate to propose such a plan (government assistance to communities, employers, and workers injured by tariff changes) in the tariff area only."
13. Movement toward establishment of a free currency exchange throughout the world and more favorable foreign investment conditions.
14. Reduction in taxes on income earned abroad.
15. An end to economic aid abroad in the form of gifts and substitution, if necessary, of a loan program. "No further aid is justified unless it contributes to the security of the United States." Technical assistance should be pressed forward vigorously through sound projects in underdeveloped areas.
16. "So far as it can be done without jeopardizing military security and subject to the embargo on Communist China and North Korea, the United States acquiesce in more trade in peaceful goods between Western Europe and the Soviet Union."
17. "...A dynamic foreign economic policy as it relates to agriculture cannot be built out of a maze of restrictive devices such as inflexible price-support programs which result in fixed prices, open or concealed export subsidies, import quotas at home and abroad, excessive use of tariffs here and abroad, exchange restrictions, and state trading. If we are to have a foreign economic policy which will make its best contribution to the strengthening of our long-term development of foreign markets for farmers, we must move as rapidly as feasible toward the elimination of such devices as a part of, or supplement to, our own agricultural policy."
18. Provisions of the General Agreement on Tariff and Trade should be renegotiated to confine functions to sponsoring trade negotiations, recommending trade policies and providing a consultation forum in trade disputes, subject to the approval of the Congress.

The programs for Congressional and Executive action suggested by the report will be subject to study and hearings by the appropriate committees in Congress and other Government departments.



Wholesale Prices, December 1953

Wholesale Prices, December 1953: Wholesale prices for edible fishery products rose from November to December because landings of fresh fish were light. Demand for most fishery products was moderate during the period. December prices were also above a year ago. The over-all edible fish and shellfish (fresh, frozen, and canned) wholesale index for December 1953 was 109.4 percent of the 1947-49 average (see table)--3.1 percent above the November index and 4.6 percent higher than a year earlier.



The drawn, dressed, or whole finfish subgroup index registered the largest increase--7.1 percent higher than November and 11.2 percent above December 1952. December catches were generally light and the demand was moderate to good. Substantial increases were noted from November to December in the prices for large offshore haddock at Boston (17.2 percent), whitefish at New York City (25.0 percent), and lake trout at Chicago (16.2 percent). Compared to a year earlier, haddock prices were up 30.8 percent, whitefish prices at New York City were up 31.5 percent, and other items under this subgroup were priced slightly higher except Western halibut which was priced 10.6 percent lower.

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices (\$)		Indexes (1947-49=100)			
			Dec. 1953	Nov. 1953	Dec. 1953	Nov. 1953	Oct. 1952	
							Dec. 1952	
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)								
Fresh & Frozen Fishery Products:								
Drawn, Dressed, or Whole Finfish:								
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.15	.12	148.2	126.4	162.0	113.3
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.30	.30	93.4	91.8	93.9	104.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.50	.52	111.2	115.7	123.9	109.5
Whitefish, L. Superior, drawn (drsd.), fresh	Chicago	lb.	.37	.35	90.5	85.5	121.5	83.0
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.63	.50	126.4	101.1	104.1	96.1
Lake trout, domestic, No. 1, drawn (drsd.) fresh	Chicago	lb.	.61	.53	125.0	107.6	107.6	124.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.49	.44	93.8	102.0	105.5	91.4
Processed, Fresh (Fish and Shellfish):								
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.38	136.1	129.3	129.3	91.9
Shrimp, lge. (26-30 count), headless, fresh or frozen	New York	lb.	.73	.68	114.4	107.9	106.4	110.7
Oysters, shucked, standards	Norfolk	gal.	5.13	5.25	126.8	129.9	129.9	129.9
Processed, Frozen (Fish & Shellfish):								
Fillets: Flounder (yellowtail), skinless, 10-lb. pkg.	Boston	lb.	.31	.31	108.7	108.7	108.7	119.2
Haddock, sml., skins on, 10-lb. cello-pack	Boston	lb.	.27	.27	100.4	100.4	98.6	98.5
Ocean perch, skins on, 10-lb. cello-pack.	Gloucester	lb.	.23	.22	110.7	105.9	105.9	114.4
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.72	.71	111.1	109.9	102.2	111.8
Canned Fishery Products:								
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	17.70	17.70	93.9	93.9	93.9	99.1
Tuna, lt. meat, solid pack, No. 1/2 tuns (7 oz.), 48 cans/cs.	Los Angeles	case	15.30	15.30	95.5	95.5	95.5	90.5
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	case	9.25	9.25	108.0	108.0	108.0	108.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3 1/4 oz.), 100 cans/cs.	New York	case	8.20	8.20	87.3	87.3	87.3	76.6

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs.

In the fresh processed fish and shellfish subgroup, December prices of haddock fillets at Boston and large shrimp at New York were higher but shucked oyster prices were lower than in November. The shrimp market was quite firm as landings continued good. Compared with December 1952, prices for haddock fillets were up 48.1 percent, shrimp 3.3 percent, but oysters were down 2.4 percent. This subgroup's December index was up 2.2 percent from November and 4.6 percent higher than a year earlier.

There were only slight changes (2.2 percent) in frozen processed fish and shellfish prices from November to December. Prices for fillets of haddock and flounder were unchanged, while those for ocean perch fillets and large shrimp went up slightly. All frozen processed items were down slightly from December 1952, except haddock fillets which were 1.9 percent higher. Compared to December 1952, all prices in this subgroup were 4.6 percent higher.

For the second consecutive month there were no changes in the prices of any of the canned fishery products priced for the index. The market for these products has remained quite steady. When compared with a year earlier, there was only a 0.1-percent decline in canned fishery products prices as a group, but there were some marked changes among the individual items: Maine sardines were up 14.0 percent, tuna was higher by 5.5 percent, and pink salmon was down 5.2 percent.



International

UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION



MEDITERRANEAN FISHERIES COUNCIL: Spain Accepts Agreement: The Government of Spain has accepted the Agreement drafted in Rome, Italy, on September 24, 1949, for the formation of a General Fisheries Council for the Mediterranean. Notification was received by the Food and Agriculture Organization on October 19, 1953, and Spain became a member of the Council as of that date.

Tunisia Approved as Member: The Council in October unanimously approved Tunisian membership proposed by France, a November 10 U. S. Embassy dispatch from Rome reports.

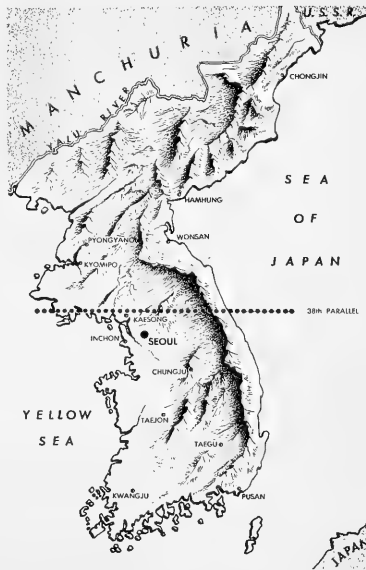
UNITED NATIONS KOREAN RECONSTRUCTION AGENCY

KOREAN FISHERIES REHABILITATION

MAKES PROGRESS: Improved fishing equipment and supplies provided by UNKRA have resulted in a six-percent increase in marine products production in 1952/53, reports a November 11 release from the United Nations. The Korean economy has improved but much remains to be done, according to a report by the Agent General of UNKRA to the United Nations Assembly.

UNKRA is charged with long-range rehabilitation of various Korean economic and welfare fields, including fisheries, and the Agency's plans are designed as follows:

1. To assist the Republic of Korea Government to restore production levels which will support the Korean people at a level equal to that of 1949-50;
2. To help that Government attain a level of exports sufficient to provide foreign exchange needed for imported goods and services;
3. To help the Republic of Korea develop economic policies conducive to the efficient development of the reconstruction program, and to help provide managerial, technical, and administrative talents necessary to a developed economy; and

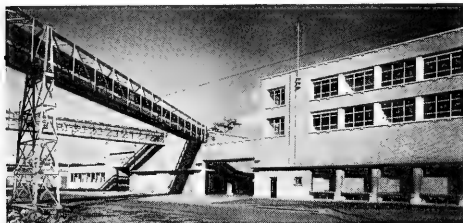


4. To carry through the economic rehabilitation of the Republic in such a way as not to militate against economic union with North Korea.



Belgium

CONSUMPTION OF FISHERY PRODUCTS, 1952/53: Belgium's available supplies from domestic sources of fresh and canned fish for the fiscal year ending July 31, 1953, totaled 62,134 metric tons, a U. S. Embassy dispatch from Brussels dated November 4 points out. Net imports of fresh and canned fish amounted to about 27,000 tons. Since very little fish and canned fish is stored, apparent annual consumption of fresh and canned fish amounted to 89,000 tons. In addition, for fiscal year 1952/53 imports and consumption of mussels, oysters, and a small quantity of fresh and canned lobster totaled almost 25,000 tons (the mussels and oysters are included as weight in the shell). Since fresh fish is preferred in Belgium, fish consumption is governed largely by the fish catch.



A MODERN BELGIAN FISH PLANT AT OSTEND. NOTE CONVEYOR SYSTEM ON THE LEFT.

Net imports of fish oil for fiscal year 1952/53 totaled 13,565 metric tons. Domestic production and apparent consumption of fish oil is not available.

Actual imports for August 1, 1952-July 31, 1953, of fresh and canned fish amounted to 37,857 metric tons, while mussels, oysters, etc. totaled 24,891 tons. Exports during the same period of fresh and canned fish were reported as 10,798 tons, while mussels, oysters, etc. totaled merely 165 tons.



Burma

NEW IMPORT DUTIES ON FISHERY PRODUCTS: The Burmese Customs Tariff Act of 1953 was introduced in the Burmese Parliament on September 30, and became effective on October 1, 1953. New import duties on fishery products included in the Act are as follows:

Item No.	Name of Article	Rate of Duty
7	Fish, dried or salted	25 pyas per viss ($1\frac{1}{2}$ U. S. cents per pound)
8	Fish and fish products in airtight containers	35 percent ad valorem
9	Prawns, dried	50 pyas per viss (3 U. S. cents per pound)
10	Isinglass	25 percent ad valorem
11	Fish and fish products, not elsewhere specified-- crustacea and molluscs and preparations thereof	35 percent ad valorem
48	Fish oils, animal oils, and vegetable non-essential oils, n. e. s.	15 percent ad valorem
98	Fishing nets	10 percent ad valorem
125	Fish hooks	15 percent ad valorem



Canada

NEW SHRIMP GROUND OFF PACIFIC COAST: A new shrimp-trawling ground was developed during the latter part of 1952 and the early part of 1953 off the Pacific Coast of Canada, reports the April 1953 *Trade News*, a Canadian Government publication. It is located in the region of Stuart Channel along the lower east coast of Vancouver Island. Preliminary statistics released by the Canadian Department of Fisheries show that during the months of December 1952 and January 1953 a total of 66,195 pounds of shrimp were caught in 183 trawling days. Most of the landings were landed and processed at Steveston, British Columbia.

Five species of shrimps have been taken for many years in commercial quantities by British Columbia fishermen. Examination of samples of the Stuart Channel catch by the Pacific Biological Station of the Fisheries Research Board of Canada at Nanaimo, B. C., indicates that the catch is almost entirely of a species not previously taken in any numbers. This species (*Pandalus jordani*) looks a good deal like the "pink" shrimp (*Pandalus borealis*). The new commercial shrimp differs, however, in that it lacks the "pink" shrimp's characteristic spines on the upper surface of the third and fourth abdominal segments. As yet no common name has been suggested for the species caught in Stuart Channel.

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FILLET CONVEYOR BELT TRANSFER ROLLERS: Two slightly differing transfer rollers for fillet conveyor belts have been in use successfully at the Atlantic Fisheries Experimental Station of the Fisheries Research Board of Canada, Halifax, N. S. These rollers serve to transfer fillets from one conveyor belt to another conveyor belt, or drum, running in the same direction at a slightly faster speed and at a slightly lower level, reports the October 1953 *Trade News*, a Canadian Department of Fisheries periodical.

One transfer roller (fig. 1) consists of a piece of ribbed one-inch rubber hose slipped over a piece of one-inch steel shafting. The hose is the same length as the width of the belt. This roller is placed close to the end pulley of conveyor belt number one with the shaft of the transfer roller in a horizontal plant. The other conveyor belt is placed slightly lower than the first belt to receive the fillets from the transfer roller.

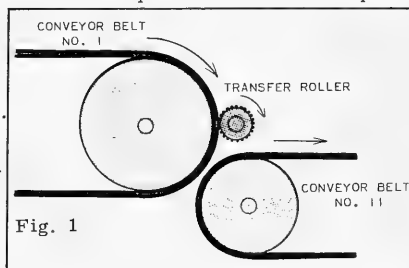


Fig. 1

The second transfer roller (fig. 2) differs from the first in that it consists of a wooden roller $\frac{1}{2}$ inches in diameter and with its length equal to the width of the belt. It is slotted longitudinally with 12-1/16 inch wide slots, $\frac{1}{4}$ -inch deep. In these slots are cemented rubber strips $\frac{1}{2}$ -inch wide by 1/16-inch thick.

Both of these transfer rollers will satisfactorily remove a fillet from the first conveyor belt and place it on the second belt in the same relative position it had on the first belt, free from folds and wrinkles.

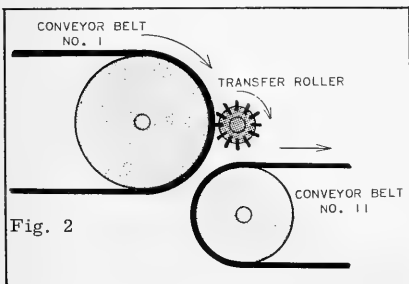


Fig. 2

Even fillets which come off the first belt with ends doubled under are, for the most part, straightened out by this transfer roller and lie flat on the second belt.

The transfer rollers are positively driven from the drive of the first belt by means of roller chain and sprockets. The transfer roller must rotate a little faster than the first conveyor belt but slower than the second belt. That is, its speed must be fast enough to pull the fillet from the first belt and the speed of the second belt must be fast enough to pull the fillet from the transfer roller if wrinkling and folding are to be avoided.

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NEWFOUNDLAND'S FISH FILLET INDUSTRY, 1952: Production: The production of fish fillets in Newfoundland during 1952 totaled 36,929,673 pounds of which 33,048,494

Table 1 - Newfoundland's Production of Fish Fillets, 1951 and 1952

Type	1952 Lbs.	1951 Lbs.
Groundfish Fillets:		
Cod	20,562,733	16,901,988
Haddock	3,744,504	2,020,601
Ocean perch	8,741,257	9,659,116
Total Groundfish Fillets	33,048,494	28,581,705
Other Fillets:		
Ocean catfish	97,068	119,784
Flounder	3,056,805	3,051,698
Gray sole	579,076	731,803
Halibut	148,230	261,355
Total Other Fillets ...	3,881,179	4,164,640
Grand total	36,929,673	32,746,345

pounds were groundfish fillets. Cod comprised the major portion of the production. In 1951 a total of 32,746,345 pounds of fillets were produced of which 28,581,705 pounds were groundfish fillets. (See table 1.)

Stocks of frozen fillets on hand in Newfoundland at the end of 1952 totaled 3,672,980 pounds (3,333,870 pounds were groundfish fillets) as compared with 1,061,855 pounds (662,853 pounds were groundfish fillets) in 1951. (See table 2.)

percent of all groundfish landed in Newfoundland are caught by vessels owned by the fillet plants. The fishermen operate on a percentage share of the catch, generally 37 percent of the gross value. The engineers on these vessels are on a salary plus a percentage of the catch agreed upon in individual cases.

Vessels: Between 70-75

Table 2 - Stocks of Groundfish Fillets in Newfoundland, December 31, 1951 and 1952

Type	Dec. 31, 1952 Lbs.	Dec. 31, 1951 Lbs.
Groundfish Fillets:		
Cod	2,907,445	543,924
Haddock	64,986	17,013
Ocean perch	361,439	101,916
Total Groundfish Fillets	3,333,870	662,853
Other Fillets:		
Ocean catfish	1,680	160
Flounder	236,288	331,306
Gray sole	93,293	65,720
Halibut	7,849	1,816
Total Other Fillets ...	339,110	399,002
Grand total	3,672,980	1,061,855

It is estimated that in 1952 a total of 670 vessels including (7 refrigerated vessels) operated in Newfoundland directly and indirectly in support of the filleting industry. In 1948 there were about twice this number of vessels but less refrigerated vessels. The maximum capacity of the smaller fishing vessels is 5,000 pounds. Some of the vessels fish for filleting plants on a part-time basis only.

About 25 long-liner vessels were built for the Newfoundland fisheries in 1952 and the first half of 1953. These vessels are too small for fishing on the Grand Banks, but the Provincial and Federal Governments have been trying to popularize the vessel with the fishermen. However, the average Newfoundland fisherman has not been too ready to accept this innovation. The dragger-type vessel remains as popular as ever.

In 1951 the Government built a Danish seine-type vessel (25 feet in length) in order to experiment with the Danish seine. This type of gear utilizes a net which sweeps the sea floor, but it can be used only where a sandy or mud bottom exists. However, several different types of fishing gear can be used by this experimental vessel. Only a few of these vessels were in use by mid-1953, but the Government hopes that fishermen will adopt them more readily in the future.

Prices: There is no information available on ex-vessel prices for company-owned vessels. Independent fishermen sold drawn cod to the fillet producers in 1952 at an average of 2½ Canadian cents a pound. (It is generally agreed between fishermen and buyers that cod will measure not less than 18 inches in length.) Landings of haddock and ocean perch (rosefish) by independent fishermen are negligible and of little importance. During 1952 and the first part of 1953 the average ex-vessel price for drawn haddock was 2½ Canadian cents a pound, and for ocean perch 2 Canadian cents a pound.

Processing and Packaging: Early in 1953 the precooking of cod and haddock was "given a try to see how the consumer would react." It is too early to judge results but the market is being watched carefully. Consumer-size packages of fillets were also tried. They were usually the one-pound cellophane-wrapped packages packed in "open-tray" containers. Fillets frozen in 16- to 20-pound blocks for the restaurant and hotel business were again introduced.

Distribution Facilities: There were no important changes in the transportation facilities during 1952 or up to September 1953. About 80 percent of all fillets exported to the United States from Newfoundland are shipped on producer-owned and operated refrigerated vessels. There are seven of these vessels at present (also one local commercial shipping line carries fillets on occasions to Boston and New York). These vessels are small, averaging 400 tons, and are maintained only by the larger producers. When space is available they also carry shipments for producers who do not own vessels. Most of the fillets shipped to the United States enter through the ports of Boston, Mass., New York, N. Y., and Providence, R. I.

There were no particular changes in freight rates during 1952 or up to September 1953, although Newfoundland longshoremen averaged a 10-percent wage increase during 1952 which raised transportation costs slightly over 1951. Fillets are shipped out of St. John's, Burin, Fermeuse, Gaultois, and Harbour Grace during the entire year. Summer shipments only go out of Bonavista, St. Anthony, and Englee.

Federal Fisheries Survey: The Canadian Department of Fisheries is presently carrying out three separate surveys to obtain data for use in future developments of all branches of the Newfoundland fisheries. One is an engineering survey of settlements on the Northeast Coast to determine the potential of various ports as centers for increased fish production. Another survey has started at Cape LaHune and will cover the Southeast Coast to Port aux Basques and the West Coast to Cape Norman. The third survey party is in Labrador examining the rivers. Information is also being collected by 27 different Fisheries Officers scattered through Newfoundland who submit monthly statistics on numbers of fishermen employed, boats, type of gear used, etc.

Exports: Almost all groundfish fillets shipped from Newfoundland are exported to the United States (table 3). (A small quantity is shipped to St. Pierre and Miquelon Islands.) The Canadian mainland also receives some Newfoundland fillets.

Species	Exports to U. S.	Shipped to Canada Mainland	Local Sales ^{1/}
	Lbs.	Lbs.	Lbs.
Groundfish Fillets:			
Cod	17,075,367	375,615	345,343
Haddock	3,812,967	35,600	2,330
Pollock	162,300	-	-
Ocean perch	8,390,101	78,314	-
Total Groundfish Fillets	29,440,735	489,529	347,673
Other Fillets:			
Flatfish	3,768,904	54,430	-
Ocean catfish	84,142	-	-
Halibut	89,921	-	-
Total Other Fillets	3,942,967	54,430	-
Grand Total	33,383,702	543,959	347,673

^{1/}ALL LOCAL SALES ARE NOT INCLUDED, ALTHOUGH THE DATA REPRESENT A CONSIDERABLE PORTION OF THE LOCAL SALES.

Marketing Conditions in 1953: January 1953 commenced a period of uncertainty for the Newfoundland groundfish fillet industry, in strong contrast to a year earlier when market conditions were generally very good. Conditions during the first six months of 1953 were described by fillet exporters as weak and very poor. As of July 1953 the outlook was not considered alarming but more uncertain with potential dangers. Producers were not building up inventories and produced only enough to fill orders. Low quotations on the United States market were offered by competitors elsewhere.

Although the Newfoundland frozen groundfish fillet industry takes a long-range view on the situation, it believes that market conditions in the United States will become more normal in the near future.

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GREAT LAKES FISHERIES RESEARCH COMMITTEE ESTABLISHED: In view of the serious decline in the Great Lakes fisheries, the Canadian Federal Government and the Ontario Provincial Government recently established a Great Lakes Fisheries Research Committee. This Committee will coordinate and expand fishery research in the Canadian waters of the Great Lakes, reports the October 1953 Trade News, a Canadian Department of Fisheries magazine. This Federal-Provincial Great Lakes program will give equal emphasis to general fisheries research and lamprey control.

The Ontario Government in 1953 provided one-half the total amount spent to further Great Lakes research generally through continuation of investigations and the loan of boats, equipment, and personnel. The Federal Government provided C\$50,000, and this was to be spent on a new program to investigate the sea lamprey and establish devices to control its numbers in the Great Lakes. Both governments have also provided an additional C\$10,000 each to cover administrative costs relative to the over-all Great Lakes fisheries research program.

In 1954 the Federal-Provincial committee is planning to expand fisheries research in all the Great Lakes. In Lake Huron there will be a continuation of the commercial fishery operation at South Bay, Ontario, along with investigations into the stocks of whitefish and lake trout. Hydrographic surveys will also be extended.

Experimental planting of lake trout will take place in Lake Superior, as well as investigations into the fishery for these stocks. In most of the Great Lakes, research will be conducted into the possible utilization of the less popular species which enter the nets of the commercial fishermen.

Sea Lamprey Control Program: As part of the 1953/54 sea lamprey control program, preliminary surveys were made in over 40 streams on the eastern shore of Lake Superior, from Sault Ste. Marie north and west to the Montreal River. A series of temperature tests and the measuring of water levels has been instituted in these streams.

Electric weirs are being installed on the Stokeley, Harmony, and Sable Rivers, while other types of lamprey barriers are to be constructed on Sawmill Creek and the Pancake River. A dam at Poplar Dale on Bennett Creek is to be repaired to provide a physical barrier to lamprey migration. To get to the sites of these installations, access roads are being bulldozed to facilitate the job of getting equipment to the areas and poles are being erected to carry line power where this is available. A field headquarters for lamprey work has been set up at Sault Ste. Marie, Ontario.

The first Canadian electric weirs were scheduled for completion in the fall of 1953. As migrant sea lampreys display little or no avoidance reaction to an electric field in the water, it is hoped that the installation of such weirs will eventually bring the lamprey under control. Other migrant fishes, however, react sensitively to very weak gradients at the fringe of an electrical field and have a tendency to avoid them. Thus these species can be directed through fish passes at the side of the barriers to reach normal spawning areas. The lamprey shows no such reaction. Characteristically, the lamprey swims into a field of increasing intensity, laboring against oncoming paralysis

until complete paralysis prevents any muscular movement whatsoever. These then drift with the current away from the barrier and are prevented from reaching suitable spawning areas.

Lampreys have now become plentiful in the extreme eastern end of Lake Superior, although first reported in this body of water only a few years ago. Fear has been expressed in some quarters that the lamprey is responsible for the collapse of the commercially-important lake trout stocks in Lake Huron and Lake Michigan, and that a similar fate awaits these stocks in Lake Superior. Observers point out that experience has shown that complete collapse of a fishery through lamprey attacks can come about in a few years.

As previously mentioned, the major portion of the lamprey budget of the Federal-Provincial committee for this year is being expended on a survey of streams and for the installation of control devices. However, about 10 percent of this is being utilized on experiments to discover possible methods of destroying "ammocoetes" (lamprey in the larval stage).

Extensive work will be done in 1954 also in streams along the eastern shore of Lake Superior on the installation of additional weirs and electrical devices. The parasitic sea lamprey has been able to adjust itself in the Great Lakes to spending its entire life cycle in fresh water. It is known to be native to Lake Ontario and some lakes of northern New York. In coastal areas the sea lamprey usually migrates to the ocean to mature, returning only to fresh water to spawn.

Injury by lampreys to other species of fish than lake trout is increasing to an alarming extent, according to biologists. Apparently as lake trout stocks dwindled the lamprey began to attack other species in both Lake Huron and Lake Michigan. Most commercial species are believed to be subject to some lamprey depredations.

The United States has been carrying out a sea lamprey control program. During the fiscal year 1953 sea lamprey control structures were installed or put under construction in all known or potential spawning streams tributary to the Michigan waters of Lake Superior. A new appropriation by the United States will make possible the completion of structures not yet finished in this area and the installation of barriers in Wisconsin and Minnesota streams as well. Research on new and more effective control measures will be centered on means of destroying larval lampreys in streams. In the development of larval controls the problem of destroying "ammocoetes" without inflicting undue injury to other fish and fish-food organisms in the streams will be tackled. Along with the sea lamprey research, investigations will be made of Great Lakes fisheries that have been affected directly by this parasite or indirectly as the result of shifts of fishing pressure.



Chile

FISHERIES PRODUCTION, 1952: Chilean production of fish and shellfish in 1952 amounted to 118,286 metric tons (see table), reports an October 21 U. S. Embassy

Chilean Production of Fish and Shellfish, 1952 and Comparative Data			
	1952	1951	1936-38 Average
		(Metric tons)	
Fish	94,370	73,106	26,824
Shellfish	23,916	19,931	7,216
Total	118,286	93,037	34,040

dispatch from Santiago. This is an increase of 27 percent as compared with 1951, and $3\frac{1}{2}$ times greater than the 1936-38 average annual production.

Colombia

U. S. PURSE SEINER TO FISH FOR COLOMBIAN FIRM: The Colombian Government has authorized a firm operating a Barranquilla fish cannery to contract with a United States firm to bring a U. S. purse seiner to fish in Colombian waters, a November 16, 1953, U. S. consular dispatch from Barranquilla reports. The catch of this vessel will be deposited with or divided with the Barranquilla cannery. This cannery recently built a refrigeration plant for storing fish; and the Government is looking into the prospects of increasing storage space for frozen fish in major cities of the interior for domestic consumption.

A considerable reduction in import duties on square tin cans (imported from the United States) was recently made by the Colombian Government, and the local fish-canning industry believes that this will be of substantial aid in producing canned fish.



Denmark

GOVERNMENT SEEKS TO EXTEND FAROE ISLANDS TERRITORIAL LIMITS: Denmark is seeking to extend the fishing limits of the Faroe Islands from three to four miles, reports the October 31 Fish Trades Gazette, a British fishery magazine. Denmark has approached the British Government with a view to a revision of the 1901 Convention, which defined international and Danish fishing limits round the Faroe Isles, and the question was to be discussed by fishery experts at an early meeting in London.

This proposal would have a serious effect on British fishing as a number of Grimsby trawlers fish the Faroe grounds.

A spokesman of the Danish Embassy in London stated that the reason for the proposed changes was to protect fish-breeding grounds and fishing banks near the coast for Faroe fishermen.

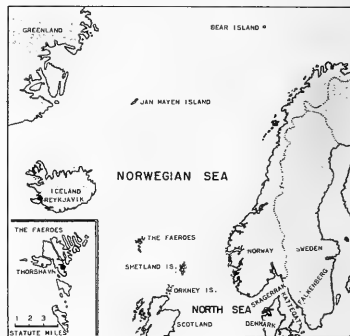
Commenting upon the situation, he said, "Norway had her dispute settled at The Hague Court last year and then the Icelandic people wanted to extend their limits. The Faroe Isles have the same interests and are suggesting a revision of the 1901 Convention. The British Government has agreed to have an experts' conference upon this matter."

He added that it was not a major case as it involved only small alterations to the treaty at the moment and that very little fish came into Britain from Faroe as not so many trawlers went to Faroe as to Iceland and West Greenland. No details of the proposed revision were available.

The president of the British Trawlers' Federation, commenting upon this latest development, said "I am pleased that the Danish Government are evidently prepared to negotiate on this rather than to take arbitrary action of the kind taken by Iceland." He added that any major revision of the fishing limits at Faroe would have a serious effect upon the British fishing industry, and that of Grimsby in particular.

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HERRING MEAL AND OIL INDUSTRY: Danish production of fish meal in 1953 was expected to reach about 20,000 metric tons as compared to 18,295 tons in 1952 and 14,680 tons in 1951, reports the September 1953 International Fish Journal, a Danish fishery magazine. Most of the meal is produced from herring although other species



are beginning to be utilized. For example, in the spring of 1953, 15 million pounds of sand eels were reduced to fish meal. It is reported that fish meal from sand eels is of very high quality.

About 6,000 tons of herring meal were exported in 1952, more than half of which went to the United States. West Germany and Belgium also took sizable quantities. Fish meal is the most important export product of the herring fishery. The capacity of the nine Danish fish-meal factories is not equal to the demand. The United States market is reported asking for more Danish herring meal than can be delivered.

Danish fish-meal factories cannot handle all the herring landed. As in previous years, the Norwegian floating fish-meal factoryship *Clupea*, anchored outside the port of Esbjerg in 1953 and again aided in processing the herring that could not be handled by the Danish factories. The *Clupea* pays the fishermen the same prices as the factories and retains the fish meal for export. In 1952 this vessel bought 8,400 metric tons of herring, valued at 1.5 million kroner (US\$217,000) to the fishermen; and in 1951, 7,369 metric tons, valued at 1.7 million kroner (US\$246,000). Fish-meal factories this year paid 0.21 Danish kroner per kilo (US\$30 per metric ton) to the fishermen for herring.

The Danish fish catch in 1952 totaled 682 million pounds and 284 million pounds was utilized for reduction purposes.

Production of fish oil increased from 4,900 metric tons in 1951 to 5,820 tons in 1952. Fish oil was at one time the most important product of the herring fishery, but it has become more difficult to sell. However, business is still fairly good with most of the oil sold to German margarine producers. Holland and Spain were new buyers in 1953.

A Danish fish-meal factory in Skagan is reported to have found a method of producing the so-called "hermetikolie" (canned food oil). About 2,000 metric tons of this food oil are used in Denmark yearly. Previously only the Norwegians knew how to produce this oil.



Ecuador

U. S. -ECUADOR FISHERY CONFERENCE RECOMMENDATIONS: Senate Recommends Implementation: In a surprise move on October 2, 1953, the Ecuadoran Senate adopted a resolution recommending that the Minister of Economy immediately implement the recommendations formulated at the United States-Ecuador Fishery Conference held at Quito in March and April 1953. This resolution was printed in *Registro Oficial* No. 340 of October 15, 1953, reports a U. S. Embassy dispatch from Quito dated October 21.

The Ecuadoran Senate made this resolution after considering:

"That the total revenues collected as a result of taxes on fishing has suffered a deep decline thus gravely injuring the participants in such revenues, which are the Navy, the cities of Tulean and Macara, and all of the coastal provinces and the Galapagos;

"That according to the conclusions adopted by the International Conference on Fisheries which took place at Quito in the months of March and April of the present year (1953), this situation would be remedied by the adoption of the recommendations formulated in that same conference;

"That the Minister of Economy and Fisheries stated in his Report to the Nation his absolute conformity with such recommendations and the necessity to carry them into practice as soon as possible;

"That according to the Law on Fisheries and Maritime Hunting now in force, especially Articles 8, 11, and 12, the Executive Power has full legal authority to dictate the dispositions necessary in order that these measures and recommendations might enter into force."

Chamber of Deputies Also Recommends Implementation: On November 5 the Ecuadoran Chamber of Deputies also adopted a Resolution recommending that the Executive Branch implement the recommendations, reports a November 30 U. S. Embassy dispatch from Quito. The Chamber's Resolution was printed in Registro Oficial No. 364 of November 14, 1953, and the wording is similar to the Resolution passed by the Senate.



El Salvador

TECHNICAL ASSISTANCE AGREEMENT WITH U. S. FOR DEVELOPING FISHERIES CONTINUED: The Salvadorean Legislature has approved an agreement between the United States and El Salvador calling for continued technical assistance from the United States in developing the Salvadorean fishing industry, the November 20, 1953, Journal of Commerce reports.

Under Point Four, technical assistance for developing El Salvador's fishing industry has been available to that country since 1951 and has been extended since on different occasions. Administration of the program now is under the United States Foreign Operations Administration. The technical assistance mission is presently operating in Pacific waters off El Salvador with a modern fishing craft acquired in California by the Salvadorean Government.

El Salvador could produce a total of some 18 million pounds of fish and shrimp a year. The Salvadorean press attributes this statement to members of the technical assistance mission.

Meanwhile Salvadorean capital is reported to be planning an enterprise in which 5 million colones (US\$2 million) would be invested for development of El Salvador's deep-sea fishing resources. Using the modern fishing vessel purchased by the Government, technical assistance specialists have been bringing in large catches from Pacific waters, according to reports.



France

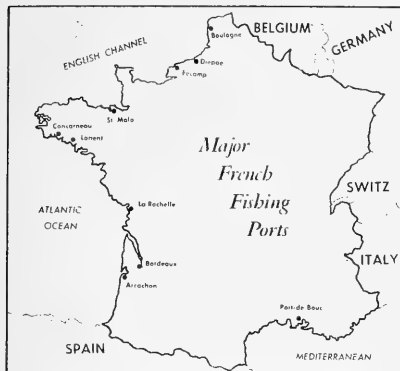
REVIEW OF FISHING INDUSTRY: The French fishing industry employs some 120,000 Frenchmen, directly or indirectly, making it the nation's fifth largest occupation, according to the August 17, 1953, France Actuelle, a French news bulletin.

The French fishing industry suffered extensive damage during World War II. Some 60 percent of its long-distance fleet, 66 percent of its steel trawlers, and 25 percent of its wooden vessels were destroyed in one way or another. Many of the chief fishing ports were heavily bombed, destroying docks, warehouses, and refrigeration plants.

Since the Liberation, the industry has made a strong comeback. New vessels and facilities have just about replaced those lost during the war. The tonnage of fish caught has regained the prewar level, and serious efforts are being made to increase it. New problems have also developed.

Many of the towns strung along the English Channel, the Atlantic Ocean, and the Mediterranean derive the greater part of their livelihood from the fishing industry.

Chief ports for commercial fishing are Boulogne, Dieppe, Fecamp, Saint-Malo, Concarneau, Lorient, La Rochelle, Bordeaux, Arcachon, and Port-de-Bouc. The port of Boulogne accounts for one-third of France's total catch. But a considerable aggregate comes from the thousands of fishermen whose small boats put out from every cover and inlet along the coast.



The fishing grounds extend from the coast to mid-ocean, but are concentrated in the North Sea, the Channel, the sea north and south of Ireland and, of course, the North Atlantic, from Newfoundland to Spitzbergen.

Large sailing vessels have all but disappeared, and coal-burning steam trawlers have given way to Diesel-powered boats. But there is still an un-economical large portion of coal burners in the fleet.

Of some 17,000 fishing vessels, France has only 300 heavy steel trawlers. The remainder are wooden vessels, of which 12,600 have a displacement of less than five tons. About half of the present fleet of steel trawlers has been built since World War II.

Still in service, however, are some 100 steel trawlers over 20 years old. And in the wooden fleet, 5,500 are at least 20 years old. These older boats are more costly to operate than modern types, and given the stiff competition in the fishing industry, many of them are unable to pay their own way.

One reason for this is the gradual depletion of nearby fishing grounds, which has forced French fishermen to seek out new grounds farther from home. Many of the older trawlers still in use do not have adequate power and other facilities to make these longer cruises economical.

The number of sailing vessels (including many small ones) has dropped steadily since 1936, from 12,500 to 3,500. But in the same period there has been little change in the total number of motor boats, the number being between 11,000 and 12,000. Indications are that many of these will go out of business as the distance to the fishing grounds increases.

Manning this diversified fleet are some 65,000 fishermen. They fall into two distinct categories: those who man the small fleet of long-range commercial vessels (6,000), and those who sail the much larger number of individually-owned boats of all sizes. Of the first group, crews receive a guaranteed minimum wage but also share in the proceeds of a good catch without taking any risks in the event of a poor catch. Their minimum wage is comparable to that of the merchant marine, which is better paid in France than in other European countries.

For the great majority of French fishermen, however, each sailing is a gamble. Shares in the catch are divided among the crew and owner, with some shares dedicated to amortization of the vessel and other equipment.

For the past few years, France's total catch has matched or slightly exceeded that of 1938. In 1952 it amounted to some 420,000 metric tons of fresh fish (including salt cod), valued at about US\$100,000,000. The catch of the different kinds of fish has varied with the years, and there is some evidence that certain species are becoming less plentiful. Herring, cod, mackerel, tuna, and sardine make up a large part of the total French catch.

The annual per-capita consumption of fish in France is 23 pounds, while that of Norway is 127 pounds, Portugal 98 pounds, and England 52 pounds.

The industry recently launched a campaign to promote the consumption of fish throughout France. The main barrier to be overcome is the problem of distribution--how to get fresh fish from the coast to the interior rapidly, regularly, and cheaply.

The large cities are well supplied, whether by train or refrigerated truck, but many smaller communities do not get adequate distribution. The need is for further organization of transport and sales outlets, an effort which the industry is undertaking with the cooperation of wholesalers and retailers.

France is now a net importer of fish--that is, it buys more fish from other countries than it sells to them. The imports of fresh fish in 1952 amounted to 15,000 metric tons, while exports were only 1,100 tons. France exports more salted, dried, and smoked fish than it imports (26,000 tons against 7,000 tons), but imports more canned fish than it exports (29,000 tons against 3,400).

France's inability to increase exports by any substantial amount is due to the price of French fish. It is high in comparison with the price of Norwegian or Portuguese fish. Wages, together with various social benefits, are higher in France than elsewhere. Despite the progress made in re-equipping the French fishing fleet since the war, a large portion of it is overage and uneconomic to operate. The French industry has felt keenly the threat of foreign competition. There have been ups and downs from year to year, as when the French fleet had a good season while that of Portugal fell on hard times. But the cost-price factor remains the major handicap facing French fishermen who would like to see a greater demand for their catch both at home and abroad.

In a period when a strong effort is being made to lower all trade barriers, the French fishing industry sees no solution to its problems in the raising of further import restrictions. On the contrary, the industry is concentrating on ways and means of increasing production.

Estimated cost of replacing that portion of the fleet now overage is US\$35,000,000. Even if spread over a period of four to five years, such a program is beyond the industry's own resources. Most likely source of new investment funds is the Government's second Modernization and Equipment Plan. If funds are provided, new construction is certain to make for more economical fishing.

The fish-canning industry is also due for overhauling. Average production for 1948-52 has been well below that of 1938, even though the number of cannery workers has almost doubled. An increase of two pounds or so in the per-capita consumption of fish would call for an increase of 40,000 metric tons in the annual catch--an expansion well within the capability of a fishing fleet that is being modernized. Such an increase in yield, if accompanied by real economy of operation, would help greatly to reduce the price of French fish.

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MARKETING THE FISH CATCH AT LORIENT: Lorient, on the southern coast of Brittany, has made a strong comeback since World War II and now ranks as France's second most important fishing port, after Boulogne, reports the August 17 France Actuelle, a French news bulletin. During the war its German-operated submarine pens attracted U. S. and British bombers, with the result that a good share of the port's facilities was destroyed. These have now been rebuilt. Last year Lorient handled 35,000 metric tons of fish.

Marketing of the catch in Lorient is typical of the process employed in most major French ports. Inbound trawlers announce the time of their arrival and the size of their haul by radio. When they dock, special crews go to work immediately unloading the holds.

Fish are dumped in large chests which are then trundled to sorting tables alongside the quay. There sorters segregate the fish according to variety and size. The

fish are then moved on to the auction halls, and when a sufficient number of chests have been collected a siren announces the sale.

Buyers are a special group of wholesalers, known as "mareyeurs." When they have made their purchases, the fish are moved to their warehouses adjoining the auction halls. Here the wholesalers carefully prepare and repack the fish in boxes of 40 to 50 pounds. These boxes are then placed on small carts, weighed, drawn by tractor to the rail siding, and stowed in refrigerator cars according to their destination.

The entire process is carefully coordinated according to a tight schedule. Fish arriving in the evening must be unloaded and sold no later than 11 o'clock the next morning in order for the wholesalers to make the three daily fish trains, the first of which leaves shortly after noon. One heads for the Midi and Italy, another for eastern France and Switzerland, and the third for Paris.

Refrigerated trucks are now giving the railroads stiff competition in the transportation of fish. They are able to reach some markets more rapidly than the railroads and with less handling.

Many of these marketing steps are handled in Lorient by a concessionaire who pays the Government a fee for the use of public dock and warehouse facilities. This company takes complete charge of the catch as soon as a trawler docks.



Hong Kong

MORE FISHING VESSELS ARE MECHANIZED: Hong Kong's mechanized fishing fleet increased from 153 to 189 vessels (junks) from July to September 1953, reports an October 20, 1953, release from the Hong Kong Government. This indicates the keen interest shown by Hong Kong fishermen in the mechanization of their junks. Mechanization has been largely due to credit granted fishermen by local engineering companies. The credit scheme was made possible by the Fish Marketing Organization agreeing, at the request of the fishermen, to deduct money from the proceeds of fish sales to pay off these loans.



FISHING JUNKS AT CHEUNG CHAU, A FISHING PORT SOUTHWEST OF HONG KONG.

Landings at Hong Kong were poor during the summer months of 1953, which is the slack season in the local fishing industry. Landings were particularly poor during September 1953, when successive typhoon threats forced fishermen to take shelter for many days. By the end of September, however, there were signs that the better season was approaching. Yellow croaker fishermen were pleased with results achieved to that time and expected that the coming season would be a good one. Landings by purse seiners were not as good as the previous year, although there was a decided improvement towards the end of September. Long-line fishermen again complained of sharks attacking the long lines, and attributed their light catches to this cause.



India

NORWEGIAN EQUIPMENT FOR DEVELOPMENT OF FISHERIES ARRIVES: About 500 tons of equipment for the Norwegian-aided fisheries project at Neendakara, near Quilon, Travancore-Cochin, arrived at Cochin from Norway on October 11, 1953. The equipment is reported to include fishing nets, motors for a new type of boat made in Norway for inland fishing, materials for living quarters, medicines, etc., reports an October 22 U. S. consular dispatch from Madras, India. This equipment is part of the aid India's fisheries will receive from Norway in accordance with a tri-partite agreement among India, Norway, and the United Nations.

One of the Norwegian experts attached to the project reported that a workshop for boat building was now under construction. Plants for the drying of fishing nets have been erected and arrangements for the supply of drinking water had also been completed, he said. He added further that as soon as the equipment reached Quilon, the selection of local fishermen for training in inland fishing would start.

Preliminary arrangements were complete and the project was scheduled to begin operating in the early part of November 1953.



Iran

RUSSIA TO BUY FISH AND CAVIAR: Soviet Russia may purchase fishery products valued at up to 48 million rials (US\$5 million) from the Iranian National Fisheries Company under the "Irano-Soviet Trade Quotas" for the year April 1, 1953, to March 31, 1954. The Iranian firm is successor to the Fisheries Company (Sherkat Shilat--a joint Irano-Soviet enterprise) which was dissolved following the expiration of the Soviet fisheries concession in January 1953.

The 48-million-rial quota was established following a prolonged series of meetings between representatives of the Iranian National Fisheries Company and representatives of the Soviet Government. It was finally agreed that the Soviet share (50 percent) of the value of the Caspian fisheries installations would be settled in kind. The first shipment of fishery products was scheduled to take place in October 1953. According to officials of the Iranian National Fisheries Company, the first transaction involves 10 metric tons of fish and 6 tons of caviar, which will be delivered to the Soviets at the Caspian Sea port of Bandar Pahlevi. The value of this shipment will be applied against the amount eventually determined as the total due the Soviet Union for its share of the installations. It is understood that the Soviet Union will provide its own transportation, although Iranian newspapers have reported that Iranian flag vessels will be used, states an October 22 U. S. Embassy dispatch from Tehran.



Italy

FISHERY PRODUCTS IMPORTS: Italy imported in 1951 a total of 1,117 metric tons of canned salmon and 55,620 tons of salted cod, reports the September 1953 World Fish Trade, a Danish fishery magazine. Of this, Canada supplied 1,015 metric tons of canned salmon and 9,075 tons of salted cod. In 1952 Italy reserved approximately C\$3 million for the purchase from Canada of canned salmon and a similar amount for salted cod. However, the import of canned salmon from Canada was likely to decline in 1953 as Italy must import canned salmon from Japan in the value of approximately C\$200,000 in accordance with a new trade agreement between the two countries.

Canned fishery products imported by Italy consist mostly of mackerel, tuna, anchovy, and salmon. Sale of canned salmon on the Italian market decreased after World War II

due to increased imports of canned mackerel from Norway and the Netherlands. In Italy salmon is normally considered a luxury food and usually limited to the less expensive chum salmon. Salmon is more popular than mackerel, but more expensive. It is estimated that the Italian market can consume about 80,000 cases of canned mackerel and 50,000 cases of canned salmon each year.

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LENT DOES NOT INCREASE FRESH FISH CONSUMPTION: Contrary to normal opinion, it has now been discovered in Italy that Lent does not cause an increase in the



MODERN ITALIAN RETAIL FISH MARKET.

consumption of fresh fish. During fasting periods there is, on the contrary, a tendency to eat fresh fish only on one weekday. A concentrated one-day demand influences quality, creates distribution difficulties, and on the whole affects the fresh-fish trade. This leads to a greater demand for cured fish, reports the September 1953 World Fish Trade, a fishery periodical.



Japan

CANNED AND FROZEN TUNA EXPORT QUOTA TO U. S. MAY BE RAISED: Only 2,000 short tons of frozen tuna and about 80,000 cases of canned tuna remain in the Japanese export quota to the United States for the year ending March 1954, according to the Japanese press (Nippon Suisan Shimibun, November 12). The 1953/54 winter albacore season began in December, and there were rumors about increasing the quotas.

Judging from past statistics, the winter albacore fishery was expected to produce about 15,000 tons of exportable tuna, so even if the remaining quota was taken to be 4,000 tons, it would be short by about 10,000 tons. The freezers hoped for a quota increase of around 8,000 tons, and the canners desired a considerable export quota. The canners did not plan on exporting their entire production before the end of the period, but planned to keep a "running stock" for export in April and May. In any case, they expected to find it difficult to get through to the end of the year with only the amount of the quota remaining in mid-November.

Because of the frozen tuna tariff problem, the Japanese Fisheries Agency had not reached any concrete decision as to whether to increase the quotas in this period or to permit an advance use of the next year's quotas. In either case it appeared that exports within the period of about 10,000 tons over the quota would be unavoidable.

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FIVE-YEAR PLAN FOR TUNA VESSEL CONSTRUCTION: The Japanese tuna fishery plans to build 230 steel vessels with a total tonnage of 61,500 tons, and 1,280 wooden vessels totaling 107,400 tons, in the period from 1954 to 1958, states the Japanese press (Suisan Shuho, November 1). At the end of 1952 there were 1,165 tuna boats (103,814 tons); and by the end of 1958 there will be 2,225 tuna boats (231,320 tons) in the Japanese fishery. The planned cost of this construction will be 2.1 billion yen (US \$5.8 million) for the steel vessels, and 3.5 billion yen (US\$9.8 million) for the wooden vessels, to be financed for the most part by the Japanese Government. The tuna production goal for 1958 is 552,775 metric tons as compared with 237,026 tons in 1952.

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AMERICAN SAMOA TUNA CANNERY REPRESENTATIVES VISIT JAPAN: Officials of the California firm which has leased the American Samoa tuna cannery from the Samoan Government visited Japan for two weeks early in November 1953 to study Japan's raw tuna supply potential and the prospects for the winter albacore tuna fishery. The party included the owner of a refrigerated mothership connected with the firm. It was anticipated that the party's trip would have as its objective negotiations with Japanese tuna fishermen in connection with the beginning of operations at the Samoan cannery. The industry watched this visit with interest, reports the Japanese press (Nippon Suisan Shimbun, November 16).

The Japan Tuna Boat Owners' Association had earlier made a formal bid to the U. S. company concerning the sale of raw tuna and hoped that a new route for its Japanese tuna business would be established. However, it was said that a Tokyo Fishing Company was already carrying on negotiations with the U. S. company and it is thought that perhaps the present visit may have as its objective the closing of a formal contract with the Tokyo firm. Nothing is generally known about the scope of the transaction.

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TUNA MOTHERSHIP EXPEDITION TO INDIAN OCEAN: The first Japanese tuna mothership expedition to the Indian Ocean was scheduled to sail from Hakodate the latter part of December 1953, contingent upon receipt of a license from the Japanese Fisheries Agency. The fleet consists of 10 catcher boats, 2 small fishing vessels, 2 launches, and 1 research vessel. Included among these vessels is a 3,650-ton refrigerator ship (Ginyo Maru). The production goal is 1,860 metric tons. The expedition plans to operate principally in the area of Timor in the Indian Ocean and will spend some time en route fishing in the vicinity of Formosa. Operations will continue for approximately two months, reports a November 12 U. S. consular dispatch from Sapporo. The plan is to fish in the Indian Ocean around 10° S., 118° E. for yellowfin tuna, albacore tuna, marlin, sharks, and Indian tuna, according to the Japanese press (Nippon Suisan Shimbun, December 14, 1953).

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"SAIPAN" COMPLETES ITS FIRST JAPANESE TUNA MOTHERSHIP EXPEDITION: The Japanese tuna mothership Saipan Maru (purchased from a United States firm early in 1953) returned to Tokyo on November 7, 1953, with 1,655 metric tons of long-line caught fish, 580 tons over its original production goal, according to the Japanese press (Nippon Suisan Shimbun, November 16). The Saipan Maru fleet was reported to be operating in the Gilbert Islands area.

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CANNED FISH EXPORTS INCREASE IN JANUARY-JUNE 1953: There was a substantial increase in Japanese exports of canned fish during the first six months of 1953, reports the Japanese press (Suisan Shuho, November 1). The principal items were tuna in brine which increased by 151,000 cases over the January-June period in 1952, crab meat by 31,000 cases, oil-packed tuna by 82,000 cases, sardines in tomato sauce by 100,000 cases, and saury in tomato sauce by 125,000 cases. Other canned goods exports declined slightly, but there was an over-all net increase in exports of all canned goods.

The problem of United States inspection of canned sardines has been brought closer to a solution, and future export prospects for this product look bright, according to Japanese reports.

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SODIUM ALGINATE PRODUCTION INCREASE PLANNED: A North Japan firm was established in May 1949 to manufacture sodium alginate from low-grade tangle, a November 12, 1953, U. S. consular dispatch from Sapporo reports. Tangle (an edible seaweed) abounds in the waters surrounding Hokkaido, The better grades are sold for domestic consumption and export to other Asiatic countries and the poorer grades are presently utilized as fertilizer or discarded. The Hokkaido Prefectural Government has assisted the company by the loan of machinery.

Due to poor management and production difficulties, the actual production of sodium alginate is not expected to begin until the spring of 1954. The company expects to receive a 25,000,000-yen (US\$69,000) loan from the Development Bank (a central government agency) to facilitate the construction of a factory in Semani, Hokkaido. Annual production of powdered sodium alginate is expected to amount to 120 metric tons per year, principally for export to the United States, the largest consumer of sodium alginate. According to estimates made by the company, the purchase price of low-grade tangle will be 160 yen per kan (US\$116 per metric ton), and five metric tons of tangle will yield one metric ton of sodium alginate. The total production cost of sodium alginate is estimated at 550,000 yen (US\$1,525 per metric ton) and the domestic selling price at 800,000 yen (US\$2,215 per metric ton).

The total estimated Japanese production during 1952 was 182 metric tons of powdered sodium alginate and 200 metric tons in the paste form.

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RUSSIA SEEKS FISHING VESSELS IN EXCHANGE FOR FISH: Soviet Russia desires to barter trade with Japan. Fish and fishing vessels are included in the preliminary arrangements, reports an October 27, 1953, U. S. Embassy dispatch from Tokyo. This information was obtained on a trip to Moscow by officials of a Japanese fisheries firm and a coal firm. Arrangements include the Russian export of fish to Japan in exchange for Japanese fishing vessels and other items.

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JAPANESE-KOREAN TALKS ON FISHERY QUESTION BREAK DOWN: Japanese-Korean discussions, which included a discussion of the seizure of Japanese fishing vessels by Korean authorities, were discontinued on October 21, 1953. These talks had been resumed on October 6, 1953.

Statements on the breakdown of the talks were issued by a Japanese Foreign Office Spokesman and by the Korean Minister Kim Yong-Sik.

In his statement, the Korean Minister indicated that Japanese explanations of certain statements made by the Japanese Chief Delegate in the meeting of the Property Claims Subcommittee held on October 15 were not satisfactory. The Korean Minister closed his statement as follows: "...He also stated in today's (October 21, 1953) ple-

nary session that those statements were made in his capacity as the Japanese Chief Delegate. The Korean delegation demanded that he withdraw the absurd statement and admit his previous statement was wrong. Unless he does so, the Korean side will find it impossible to continue to attend the talks since his statement is utterly unacceptable."

The statements attributed to the Japanese Chief Delegate had no reference to fisheries matters.

On October 22, 1953, a Japanese Foreign Office spokesman issued a statement regarding the breakdown of Japanese-Korean negotiations. Pertinent excerpts from this statement follow:

"The Japanese-Korean talks unfortunately broke down yesterday. This seems to have been a premeditated scheme of the Korean side.

"How did the talks get started? On September 6 of this year the Korean Government launched an indiscriminate and wholesale seizure of Japanese fishing boats. The boats thus seized illegally up to now number as many as 41, and their crew total 484 persons. On top of that, a Japanese Government vessel belonging to the Fishery Agency was also captured....

"Dr. Syngman Rhee in January last year drew a line on the high seas between Japan and Korea, and called it the Syngman Rhee Line.... The sea area so delineated was termed "Korean waters." At one spot, this line extends as far out on the high seas as 170 nautical miles from the Korean coastline.

"Japan proposed a Japanese-Korean conference on the fishery question, in order to put an end to such indiscriminate seizure. The Korean side declined to limit the subject to the fishery question alone, but insisted that it should be discussed in parallel with other issues pending between the two countries.... However, we accepted the Korean proposal without complaint.

"The agenda of the conference included mainly (1) the fishery question, (2) establishment of formal relations between the two countries, (3) the status of Koreans in Japan (numbering about 600,000), and (4) claims....

"... Japan does not find itself in a position to implore the Korean delegate to continue the talks, although the indiscriminate seizure of Japanese

fishing boats by the Korean Government is still going on.

"The Koreans contend that the so-called Rhee Line is necessary for the conservation of fishery resources. They say that their fishermen cannot catch enough fish because Japanese fishing boats are catching all the fish in the sea. (Ironically, fresh fish sold by the Republic of Korea to Japan amounted to about a million U. S. dollars last year. This shows that they are catching more fish than they consume at home.)

"It is true that the Japanese fishing fleet is overwhelmingly larger than that of Korea. This is attributable to the initiative and industry of the Japanese for which they are not to be blamed. Their annual catch before the War averaged approximately 4.5 million metric tons, and is now about 4.1 million metric tons. Most of the catch is consumed at home.

"It is necessary in the waters between Japan and Korea, as in other waters throughout the world, to conserve fishery resources. The Japanese side is prepared to adopt measures of restraint as provisional steps, with regard to the methods of fishery (for example, the brightness of fish-luring lamps) and the area of fishery, as provisional steps until such time as scientific data are collected and exact measures of restraint are determined on the basis of such data. It is further prepared to furnish the Republic of Korea with fishing boats and nets to correct the imbalance between the Japanese and Korean fishing fleets. The Japanese believe that there are plenty of fish for both the Japanese and Koreans to catch in the waters of Japan and Korea...."

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GOVERNMENT STATEMENT ON FAILURE OF JAPANESE-AUSTRALIAN FISHERIES NEGOTIATIONS: The Japanese Government submitted the following statement to the Australian Government on September 10 after the fisheries negotiations between the two governments failed, reports a September 29 U. S. Embassy dispatch from Canberra, Australia:

"1. The Japanese-Australian negotiations for a fisheries agreement, which were begun on April 13 in Canberra, have failed after the deliberations of more than 4 months. Both sides were agreed on the necessity for conservation measures regarding pearl-shell resources in the Arafura Sea, but no agreement could be reached on provisional measures concerning the operational areas and the size of catch for Japanese and Australian luggers owing to the attitude of the Australian Government

that it could not recognize the participation of Japanese luggers on an equal footing in the southern part of the Arafura Sea and adjacent waters, despite their pre-war activities. The Japanese Government desires to state its basic position and to make clear the course of the negotiations.

"2. It is an established principle of international law that the fisheries resources on the high seas are common property of all nations, and

should be open for development and utilization by all nations. In case regulation should become necessary in order to ensure the maximum sustained productivity of the resources, such regulation must be made equally applicable to the nationals of all countries who participate, or may participate in the future, in the development and utilization of those resources. The most appropriate precedent in this respect is, in the opinion of the Japanese Government, the International Convention for the Regulation of Whaling. The formula adopted in this Convention provides for limitations on total catch, physical size, operational areas and length of season, and permits the participating countries to compete freely on an equal footing within these common restrictions. With regard to pearl-shell fishing, because of its sedentary nature, it is possible to determine regulations based on more scientific grounds as further research is made on the pearl shell resources. If only the participating countries were willing to co-operate, the enforcement of the regulations could be carried out without difficulty.

"3. The initial Japanese proposal, based on the above principles, envisaged a convention, providing for (1) the establishment of an international commission, composed of the representatives of the signatory Powers; (2) the formulation by this commission of regulations based on scientific research; (3) the development and utilization in the Arafura Sea of pearl shell resources by the luggers of the interested countries under regulations designed to ensure a maximum sustained productivity. The Australian Government, claiming a paramount position on the grounds of geographical propinquity, proposed to reserve the known rich fishing grounds on the high seas off Thursday Island and Broome exclusively for Australian luggers, allocating to the Japanese luggers some pearling grounds in the areas to the west and to the east of Darwin. Even with regard to the latter areas, the majority of known banks were to be pearled exclusively by Australian luggers. In addition, the luggers of each country were to be excluded from pearling within the fishing grounds allocated to the other country. In the Australian proposal no consideration has been given to the possibility of luggers of nationality other than Australian or Japanese operating within the areas to be covered by the convention. This proposal purports to establish substantially exclusive Australian jurisdiction over the pearl shell resources outside Australian territorial waters, and rejects the principle of multi-lateral international co-operation on an equal footing for the conservation and development of such resources on the high seas.

"4. The Japanese Government is convinced that an international partition of high seas fishing grounds not only contravenes the established principles of international law concerning the freedom of the high seas but also runs counter to the objective of the conservation and development of fisheries resources. However, desirous of facilitating an amicable conclusion of the negotiations, the Japanese Delegation submitted on July 2 as its maximum concession a proposal, effective for the first three years, to permit Japanese luggers to operate in the areas to the west and to the east of Darwin, excluding the two major fishing grounds around Thursday Island and off Broome. More-

over, it was made clear that, as in the initial Japanese proposal, there was no objection to Australian luggers operating with Japanese in these areas. This proposal was made with the understanding that it would be the joint responsibility of all participating parties to make investigation and research for pearl shell resources within all areas covered by the convention. The period of three years was stipulated because it was anticipated that within this period it would become possible to establish reasonable limitations on the catch in each area based on new scientific data. Moreover, it was made clear that the Japanese Government was prepared to discuss "limitations by countries on catch" in order to prevent overfishing in the areas where Japanese and Australian luggers intermingled.

"5. While this Japanese proposal of July 2 permitted operations by Australian luggers in all areas, it indicated that Japanese luggers would operate only in limited areas, and in fact Australian luggers were to be given a far more advantageous position. Nevertheless, the Australian Government rejected the Japanese proposal, insisting that Japan should concede to Australia "the major responsibility" in the areas where intermingling would take place. This, in the view of the Japanese Government, would actually amount to treating the southern part of the Arafura Sea as if it were Australian territorial waters insofar as pearl shell fishing was concerned. The attitude of the Australian Government disregarded totally the contributions made in the past by Japanese divers in the development of the pearl-shell resources in the Arafura Sea.

"6. It would be appropriate here to describe briefly the pearlshelling activities of Japanese luggers in the Arafura Sea in 1953. The Japanese plans were communicated to the Australian Government through the Ambassador in Tokyo on October 30, 1952. The proposed areas of operation were made clear also on February 16, 1953. These Japanese plans called for the dispatch of 25 luggers during the period from March to November to areas including the fishing grounds to the west and to the east of Darwin and off the Aru Islands for pearling and research. Since it was the first Japanese operation in more than 10 years, the pearling was planned on a modest scale, fixing the maximum catch at a low figure of 1,250 tons. It may be added that in the peak pre-war period, as many as 165 Japanese luggers operated, with a catch amounting to over 3,000 tons. In March, the month in which the departure of the pearling fleet was scheduled to take place, the Australian Government proposed to open negotiations for a fisheries agreement in Canberra on April 13, but said that it would not enter into negotiations unless the departure of the Japanese luggers was delayed for at least one month, because the presence of Japanese luggers in the waters near Australia would hamper the negotiations. The Japanese Government had consistently entertained the view that, in the absence of an international agreement, it was free to permit fishing by Japanese vessels in any area on the high seas, and the Japanese Government was convinced that the pearling by Japanese luggers on such a limited scale as mentioned above would not prejudice the negotiations in any sense. However, in its earnest desire for an early conclusion of an international agreement regarding pearl-shell fishing in

the Arafura Sea, the Japanese Government disregarded the tremendous economic loss and agreed to the Australian proposal. Thus, the departure of the pearling fleet was postponed until the middle of May. Operations, which were commenced early in June, were confined to only two banks and the catch totalled 311 tons, after two months, at the end of which it was evident that, unless the luggers moved to other banks, the above two banks would be depleted. On the other hand, there was no formal response to the Japanese proposal of July 2 concerning pearling by both Australian and Japanese luggers on the three banks within the area west of Darwin, and the areas to the east of Darwin. The Japanese Ambassador in Canberra informed the Australian Government on August 10 that the Japanese luggers would commence operations on the above-mentioned three banks in the middle of August, and would then move to the fishing grounds east of Darwin in the middle of September. According to this plan, the entire fishing area for the Japanese luggers this year excluded the fishing grounds near Thursday Island and Broome, where pre-war Japanese luggers had operated; it also excluded the two banks closer to Australian territorial waters, and, since it was the first post-war operations, instructions were issued not to pearl within 10 miles of the coast throughout the areas to be fished. The Japanese

Government is convinced that the Australian Government will readily understand that this Japanese plan was quite modest and would in no way constitute a threat to Australian luggers operating from Darwin.

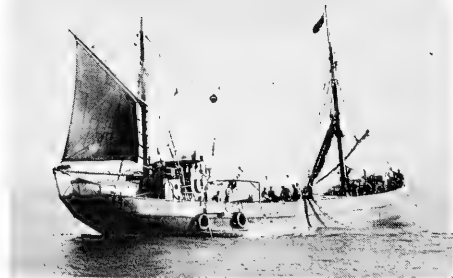
"7. Unfortunately, the conference has been called off by the Australian Delegation. The Japanese Government wishes to declare that, being deeply interested in the conservation of pearl-shell resources in the Arafura Sea, it is prepared to resume at any time negotiations based on a fair and reasonable basis. The Japanese Government also declares that, despite the absence of an international agreement, the Japanese Government will voluntarily undertake that:

- a. The conservation measures such as minimum size of shell, maximum total catch, number of vessels, etc., will be strictly observed by Japanese luggers;
- b. Japanese luggers now operating will not pearl within ten miles of the coast;
- c. All possible measures will be taken to prevent complications between Japanese and Australian fishermen."



Netherlands

U. S. AID FOR FISHERIES: The United States and the Netherlands Governments recently reached agreement on a grant of florins (equivalent to US\$1.5 million) from the so-called Moody fund (counterpart funds), reports the October 1953 Holland Fish Trade, a Netherlands trade magazine. This raises the total available amount for the Netherlands to US\$3 million (in Dutch currency). Of this amount, about fls. 2 million (US\$526,000) is destined for improved marketing and distribution of fishery products--fls. 1.5 million (US \$395,000) in the form of loans.



A TYPICAL LUGGER-TRAWLER OF THE NETHERLANDS.

the eastern and southern parts of the country; and to make loans available for retailers to improve shops and purchase containers and other selling equipment for frozen fish.

It is planned to provide for a training center for retailers and wholesalers, which can at the same time serve as a demonstration center for housewives.

The sale of ready-to-eat products and of frozen fish will be encouraged by the development of modern packing methods. The project provides for the establishment of a number of cold storages in

Another part of the program aims to raise efficiency in the fish canneries and to provide demonstration facilities on modern smoking processes in the Laboratory for Fishery Research. Finally, it is intended to make the necessary funds available for building an installation for the mechanized unloading of fish.

To carry out the project, a Central Control Board will be set up composed of representatives of the fishing industry; the labor unions; the Marketing Board; the Ministry of Agriculture, Fisheries and Food; the consumers; and the Bank for the Middle Classes. The funds will be mainly supplied through the above-mentioned bank. The vast program will be carried out within three years.

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GOVERNMENT PROPOSES AID TO FISHERIES: The Netherlands Government has introduced a bill, under which one million guilders (US\$263,000) is to be appropriated to improve the production, distribution, and processing of fishery products, states the October 1953 Holland Fish Trade, a Netherlands fishery magazine. A sum of fls. 550,000 (US\$145,000) will be made available for the building of a new research vessel. It is planned to have about a 100-foot cutter built specially fitted for scientific and technical work on board.

The Government believes that the Netherlands should take part in the international investigation of the North Sea with an up-to-date and well-equipped vessel, the more so because the Netherlands has great interests in the herring catches in these waters.

The present research vessel Antoni Leeuwenhoek, a small cutter, was originally built for the fishery in coastal waters, and has only a limited range. Therefore, it could only be used in the southern part of the North Sea below the line Den Helder-Yarmouth.

In order to acquire technical installations and to fit out the Central Laboratory for Fishery Research, an amount of about fls. 200,000 (US\$53,000) is thought to be necessary. The further outlay required for the development of the fish-canning industry is estimated at 150,000 guilders (US\$40,000).



Norway

FISHERIES TRENDS, AUGUST-OCTOBER 1953: Norwegian fishing activities were normal during the third quarter of 1953, a November 2 U. S. Embassy dispatch from Oslo reports. The sardine catch was good. The tuna catch, on the other hand, was only about 7,000 metric tons as compared with about 11,000 tons during the corresponding period in 1952.

Export possibilities for klipfish (dry-salted cod) were not favorable. Stocks were reported to total about 40,000 tons, or more than at any time since the end of World War II. Because of high prices paid to domestic fishermen, Norway is having difficulty in competing with Iceland for foreign markets, especially Brazil. World market prices for dried fish have declined about 20 percent during the past few months.

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COASTAL HERRING FISHERY FUTURE UNCERTAIN: The future of the Norwegian coastal herring fishery is uncertain, warns the Director of the Norwegian Fisheries Directorate's Ocean Research Institute in Bergen. The big question is whether the present period of abundant herring shoals every winter is nearing its end, according to a November 19 release from the Norwegian Information Service.

The Director commented that the volume of the spring herring catches in waters around Karmoy Island already has been sharply reduced. The herring appears now to be spawning on banks in the North Sea and Skagerak, rather than along the west coast of Norway. These and sundry problems will be thoroughly investigated during the winter cruise of the research vessel G. O. Sars. The findings will be studied with keen interest.

The Institute in Bergen has in recent years conducted extensive investigations centered on the habits and migration paths of the herring. As the result of large-scale tagging, it has been established that the Iceland herring and the fat and spring herring off the Norwegian coast all belong to the same family.



Panama

LEGISLATURE TO CONSIDER NINE-MILE TERRITORIAL LIMITS BILL: A bill setting nine miles as the territorial limits off the coast of Panama was recently presented to the Panamanian Legislative Assembly, according to the Panama press (La Hora, October 9, 1953). The press release states:

"The nation has the faculty," the bill says, "to fix the continental and insular marine shelf of the Republic which is limited in either ocean by the isobar to 200 meters, in other words, the line joining the points at this depth. The nation also reserves the right to establish the demarcation of our territorial waters and the zones under whose protection, control and surveillance marine life comes, and to change or alter these demarcations in accordance with circumstances or conveniences that might arise as a result of new discoveries, or extensions that might appear in the future, or as a result of international agreements regulating this matter, to which the nation might be a signer.

"By territorial sea is understood to mean those waters bordering on our coasts up to nine marine miles, from the point of lowest tide over the firm and insular coast, in lakes and river banks flowing into the sea."

The bill was sent to the Legislating Commission of Territorial Limits for study. It is possible the deputies will ask for an opinion from legal advisers.



Peru

SHRIMP FISHING OPERATIONS: There are four companies operating shrimp fishing vessels in offshore waters from Puerto Pizarro, Peru, the U. S. Embassy at Lima reported recently. These companies operate a total of 16 fishing vessels, mostly former tuna purse seiners with a beam trawl having a spread of 22 feet. In addition, there are two freezer ships with freezing capacities of 6 to 10 metric tons of shrimp a day and a storage capacity of about 200 metric tons. This shrimp fishery began in June 1953. Puerto Pizarro is near Tumbes and practically on the Ecuador border.

The average catch per vessel is about 220 pounds of shrimp per day. There are two species of shrimp caught--a small one averaging 30 to the pound (heads off), and a large species averaging 12 to the pound (heads off). Only the larger species is exported. Shrimp are usually packed in 5-pound containers. October production amounted to about 60,000 pounds.



Republic of the Philippines

MODIFICATION OF TRADE AGREEMENT WITH U. S. PROPOSED: On May 5, 1953, the Government of the Philippines submitted to the United States certain proposals for modification of the 1946 Philippine Trade Agreement. According to reports contained in the Department of State Bulletins of September 7 and October 19, 1953, these proposals provide:

1. that the present agreement be modified to provide for limited and reciprocal free trade between the two countries in such a manner that full duties would be imposed on all imports of each country except for those commodities which by agreement of the two Governments would be included in duty-free lists;
2. that the provision of the present agreement with respect to currency matters be eliminated, leaving the Philippine Government in complete control of its currency, subject only to control and regulations pursuant to its commitments to the International Monetary Fund; and
3. that provisions of the present executive agreement covering immigration and the rights and privileges extended to citizens in the fields of public utilities, land ownership, and exploitation of natural resources be made reciprocal.

In view of the importance of this matter and the careful study given it by the committees designated by the President of the Philippines, the United States as a necessary first step is making a careful examination of the proposals and other aspects of current economic relations between the two countries.

For this purpose the United States Government has established an executive committee consisting of representatives of the Departments of Agriculture, Commerce, Interior, Labor, State, and Treasury, the Foreign Operations Administration, and the Tariff Commission. This committee, which will coordinate its activities with the President's Commission on Foreign Economic Policy, is actively studying the Philippine proposals, including the additional information made available in the Philippine note of August 24 with respect to the various commodities which the Philippine Government suggests for inclusion in the selective free trade list.

The Philippine Government has provided lists of items which it proposes for selective free trade, and has given an indication of its attitude with regard to the period to be covered by the revised Agreement. Fishery products were not on the selective free trade list. Information on duties to be imposed on imports from the United States not included on the free list will have to wait the tariff revision now in preparation by the Philippine Tariff Commission. This was expected by the end of November 1953.

The Committee will first be required to determine whether, in its opinion, a basis exists for renegotiation of the 1946 Philippine Trade Agreement. The position of the United States on the Philippine proposals must await the conclusions of this Committee.

Under the Philippine Trade Act of 1946 and the exclusive trade agreement between the United States and the Philippines, "United States articles" are exempt from Philippine custom duties. Fishery products of United States production, such as canned salmon, sardines, mackerel, or herring are free of duty. The free provisions of this Act are due to expire on July 4, 1954, when duties would be applied to United States products at percentages of the basic duties, increasing in increments of 5 percent yearly until at the end of 20 years the full basic rates of duty would apply. Basic duties are those applied to products of other countries. Canned salmon, sardines, mackerel, and herring are dutiable at 15 percent ad valorem. Other fishery products are dutiable at rates up to 25 percent ad valorem.



Saudi Arabia

FISHERY DEVELOPMENT PROJECT: A large-scale fishery project administered by the Food and Agricultural Organization of the United Nations (FAO) will be carried out along the Red Sea coast of Saudi-Arabia and in the Persian Gulf, reports the September 1953 World Fish Trade, a Danish fishery periodical. It is likely that modern Danish fishery methods will be applied to the primitive fishery now carried on in the area. An Egyptian fishery biologist has been assigned as leader of the project and he has visited Denmark to study its fisheries.

The project will cost about US\$3 million and will consist of 12 ultramodern fishery centers with quick freezers, ice-making plants, and fresh-water distilling layouts along the 1,000-mile coastline. Also, it is possible that Danish cutters will be exported later.



South-West Africa

FISHERY RESEARCH: The South-West Africa Administration has two scientific research vessels, one stationed at Luderitz and the second at Walvis Bay, an October 28, 1953, U. S. Consular dispatch from Cape Town reports. Both vessels are specially equipped to do research work on spiny lobster and pilchard. The research projects conducted by these vessels are as follows: density of the shoals; finding the spawning areas; checking on breeding habits; checking on rate of depletion due to commercial fishing; and checking on subsequent rate of replenishment.

The scientists on board take water temperatures in various areas and at different depths during day and night; and it has been found that water temperatures have a definite effect on the habits of fish. Currents and the salinity of the water also determine the activities and whereabouts of the fish, although this applies less to spiny lobster than to pilchard which rely on plankton for their food. It is now claimed that the amount of plankton in the ocean increases gradually north of the Cape until it reaches a height at Mossamedes, Angola.

In addition, there are two land-based laboratories to complete the work on final analyses. There are indications that there is at least one breeding area for pilchard outside and to the north of Walvis Bay. The Officer in charge of Fisheries stated that no more than the six licenses to fish and process pilchard will be granted until it has been established that the resources are such that more licenses are warranted. At Walvis Bay, however, two licenses were granted recently for the processing of white fish (any fish other than pilchard and spiny lobster). These plants will be engaged in smoking, freezing, cleaning, and dehydrating white fish, as well as producing fish meal. One of these is erecting a £32,000 (US\$90,000) factory with capital raised locally.

The Administration is seeking more scientists for fishery research work. They require "university trained men, who have majored in zoology and chemistry."

The value of the fish products of the South-West Territory has increased from £400,000 (US\$1.1 million) in 1948 to nearly £5 million (US\$14 million) in 1953.



Spanish Morocco

FISHERY PRODUCTS IMPORTS-EXPORTS, 1952: Total imports of fishery products into Spanish Morocco in 1952 amounted to 1,548 metric tons, valued at 2,450,998 pesetas (US\$62,200), an October 28 U. S. Embassy dispatch from Tangier reports. Spanish Moroccan exports of fishery products in 1952 totaled 2,952 metric tons, valued at 54,282,734 pesetas (US\$1,378,000).



Surinam

GOOD SHRIMP FISHING POSSIBILITIES REPORTED: Large quantities of fair-size shrimp are available along the entire coastline of Surinam, a recent experimental shrimp fishing survey revealed. Between 200 and 300 pounds of shrimp could be caught in an hour, according to the survey made with trawlers over an area of 200 square miles. There is reason to believe that shrimp can be caught practically throughout the year, reports the September 1953 Caribbean Commission Monthly Information Bulletin.

The main problem is to find a market for the shrimp. Surinam itself consumes about 30 tons of dried shrimp, or about 600,000 pounds fresh weight. If there are export possibilities, considerably larger quantities could be caught.

Now that more is known about the shrimp fishing possibilities in Surinam, private firms might perhaps be interested in the sale of dried as well as frozen shrimp.

In addition to shrimp, the experimental fishing also yielded catches of scalefish, skinfish, sardines, rays, and sharks.



Sweden

CONSUMPTION OF FISHERY PRODUCTS, 1952/53: The total production of fishery products in Sweden during the fiscal year ending July 31, 1953, amounted to 292,600 metric tons, reports a November 16 U. S. Embassy dispatch from Copenhagen. In the same period imports totaled 32,000 metric tons. The available supply of fishery products totaled 324,600 tons. Of this total, 72,100 tons were used for domestic human consumption (a drop from the previous year), 136,700 tons in domestic industrial consumption, and 115,800 tons were exported. The supplies on hand as of August 31, 1953, were not known but were estimated to be very small. The amount of fishery products utilized for human consumption in 1951/52 totaled 86,900 tons.



Union of South Africa

PILCHARD CONSERVATION RECOMMENDED: As the result of a recent survey of the South African pilchard-maasbanker fishery, the Director of Fisheries made the following recommendations for the conservation of the industry, reports the October 1953 issue of The South African Shipping News and Fishing Industry Review, a South African trade magazine:

- (1) The combined annual catch of pilchards and maasbankers for the purpose of canning and/or the production of fish meal, fish oil, or fertilizer be limited to 250,000 metric tons; in pursuance thereof, a closed season of September 15 to December 31 be imposed, provided that if by August 15 it is estimated that not less than 250,000 tons will be landed, and/or spawning will be in full swing, by the end of August, the closed season shall commence on September 1, otherwise fishing may continue up to September 23 at the discretion of the Director of Fisheries.
- (2) The number of boats in the pilchard-maasbanker fishery be limited to those in commission, building, and/or firmly ordered and accepted for building as of January 31, 1953; no increase of this number to be permitted without the prior approval of a Boat Limitation Committee consisting of four fishermen's representatives and four factories' representatives under the chairmanship of the Director of Fisheries.

- (3) Section 4 of the Sea Fisheries Act, 1940 (Act No. 10 of 1940, as amended) be amended to provide for powers to (a) prescribe the quantities of fish, or any one or more species of fish, that, in any one year, may be treated in any one factory, (b) limit the number and capacity of plants that may be used generally or in any defined area for the canning of fish, and/or for the manufacture of fish meal, oil, or fertilizer, (c) prohibit any person from using in any area any vessel for manufacturing fish meal, oil, or fertilizer, or for the freezing of spiny lobster tails or for the canning of fish, (d) prescribe the quantities of canned fish, fish meal, fish oil and/or fish fertilizer that may be produced in any one year by any one factory, and (e) by notice in the Government Gazette or in writing call upon any person to furnish any required information relevant to the purposes of this Section.
- (4) The schedule to the Sea Fisheries Act, 1940, be amended to provide for an additional fee of £5 (US\$14) per year for every fishing boat engaged in catching pilchards and/or maasbankers for canning or the production of fish meal, oil, or fertilizer.

The highly-mechanized and heavily capitalized South African pilchard-maasbanker fishery and industry started in the Union in 1943/44 with a seasonal catch of 7,500 metric tons. In nine years the industry advanced with giant strides to a production of 543,000 tons. This production for the 1951/52 season was divided as follows: 294,000 tons was produced by the Union of South Africa and 249,000 tons by South-West Africa.

The Director's recommendations were accepted by the Fisheries Development Advisory Council and are now covered by the provisions of the Sea Fisheries Act of 1940 Amendment Bill, which was passed in the Union House of Assembly in September 1953.



United Kingdom

FISHING INDUSTRY CONCERNED OVER MOVES OF VARIOUS COUNTRIES TO EXTEND TERRITORIAL LIMITS: Following the lead set by Norway and Iceland, countries in various parts of the world are attempting to impose bans, controls, and restrictions on fishing in waters outside present three-mile limits. This has caused some concern to the British fishing industry, according to the October 31, 1953, issue of The Fishing News, a British fishery magazine.

Following are the latest proposals:

- (1) Faroe Islanders have asked the Danish Government to negotiate with Britain a "four-mile" offshore limit to fishing around the Islands.^{1/}
- (2) The Australian Government has imposed strict territorial control over pearl fishing in the waters of the Continental shelf.
- (3) Six Scottish M. P. 's have tabled a motion in the House of Commons to close to foreign trawlers (as they are closed to British fishermen) the fishing grounds of the Moray Firth, Minch, and Clyde.
- (4) Fishermen at Harwich and Whitstable are urging that a 12-mile limit should be imposed to keep out French fishermen or, failing that, a line should be drawn from Harwich to Dover to protect the Thames Estuary.
- (5) British trawlermen are expressing fears that Greenland will be the next to seek an extension of territorial limits.
- (6) President Syngman Rhee has imposed the "Rhee line," 60 miles off the South Korean coast, inside which only Korean vessels are allowed to fish.

^{1/}SEE PAGE 36 OF THIS ISSUE.

The Faroese move may have extremely serious consequences for the British fishing industry. It has been made by the Faroe Social Democratic Party in the Danish Parliament, who have asked the Danish Government to negotiate with Great Britain with a view to extending Faroese territorial waters from three to four miles.

The President of the British Trawlers' Federation said recently: "This move is not entirely unexpected after what Iceland has done, but we do welcome the fact that the Danish Government has been asked to negotiate with us. As long as we have the opportunity of considering these questions on the basis of friendly negotiations then we shall be satisfied. It is satisfactory to see that Denmark is going about the matter in a proper manner."

The chairman of the Hull Fishing Vessel Owners' Association commented: "I am afraid this is the modern trend. It seems to be the policy of these countries to push a British ship off the seas wherever possible and that is why we are fighting Iceland so strongly...."

"This is just one more attempt to throw the British fisherman right off the seas," said the secretary of the Grimsby Trawler Officers' Guild. "It was obvious after the extension of Icelandic territorial waters that others would follow suit and we fear Greenland may be the next. We do not know yet whether the Faroese want a simple increase of a mile or whether base lines will be involved."

* * * * *

NEW TYPE PLASTIC NET FLOAT: A new fishing net float made of an expanded plastic material and possessing unusual buoyancy has recently been put on the market by a Surrey firm, reports the October 31, 1953, issue of The Fishing News, a British trade journal. No repairs or maintenance are needed for the new float which is very light in weight, verminproof, odorless, noninflammable, resistant to gasoline, oil, and most chemicals; also, it will not support the growth of molds or bacteria.

Tests were carried out by the Norwegian Fishery Directorate with various floats sunk to depths of about 400 feet. It was found that cork floats became waterlogged, that Norwegian plastic floats were compressed to less than half size, and that the new British plastic floats were the only ones to be completely unaffected.

Tests have shown that one of these floats of one cubic foot will support a weight of 60 pounds in water indefinitely. After two weeks' complete immersion in water of 65°F. the moisture absorption was only 0.15 percent by volume.

* * * * *

ICELANDIC TRAWLER LANDS CATCH AT GRIMSBY: The Icelandic fishing trawler Ingolfur Arnarsson landed a catch of 462,000 pounds of fish at the port of Grimsby on October 14, 1953, the first such landing since the British ban on Icelandic trawlers at British ports, reports the October 17 issue of The Fishing News, a British trade periodical. This vessel was brought to Grimsby by the London financier who plans to bring many Icelandic trawlers to British ports, and market most of the fish through his own organization. The financier purchased most of the trip as there was only one bid of 56 boxes by one other firm. Another Icelandic trawler was scheduled to arrive at Grimsby late in October. Also, Icelandic trawlers were to land at two other ports, one of which will be Fraserburgh.

Talking of the future, the London businessman said: "I have already secured a one-million-pound (US\$2.8 million) order for frozen fish from a foreign country, and in the coming year I may have orders for six million pounds worth from this one government alone. It is not an Iron Curtain country. I hope to do most of this business through Grimsby, and in that case a lot of Grimsby fishermen and others in the industry, now out of work, will be in employment by this time next year."

It has been reported that there was a substantial loss on the first trawler and that subsequent landings would be handled differently and no fish offered for sale at the auctions. The financier diverted several vessels to Germany since then and it was believed that the market there affords a better price and provides ready buyers. The small merchants who would like to participate successfully agitated for meetings to be held both at Grimsby and London to consider "the rescinding of the ban on the buying of fish landed by Icelandic-owned vessels; the release of all members of the association from the effect of the ban in forbidding them to handle the catches of the Icelandic vessels; and the notification 'to all interested parties' of the result of the meeting." Moreover, one of the groups of trawler owners also suggested lifting the ban on Icelandic landings to permit two vessels to land each week for the period of one month. During this time negotiations could be carried on for a settlement of the original dispute. The Icelandic Vice-consul then stated that a temporary easement of the ban would not suffice--it must be unconditionally lifted. He further pointed out that Icelandic trawler owners have agreed to supply the London man and that commitment would have to be honored in any case. The prompt reaction of dissenting trawler owners and officers to this proposal has been outright rejection.

One group of trawler owners has announced plans to develop and improve their transport service throughout the United Kingdom by opening eight new depots in the south of England for their specially insulated aluminum trucks. This announcement has been countered by an offer from British Railways to reduce fish transport rates from the port of Hull to 28 of the main receiving centers by 40 percent, if all of the fish goes by rail beyond a 12-mile radius.

Other phases of the London Businessman's activities which may be significant are that he has established himself in an office building in London and that he is seeking a site at a dock in Grimsby to build a factory and cold storage so that fish can be landed direct for cold storage and processing, an October 30 U. S. Embassy dispatch from London points out.

* * * * *

VESSEL OWNERS TO CONTINUE ADVERTISING PROGRAM: Directors of the British Trawlers' Federation, representing the distant-water section of the industry, decided at a London meeting early in October 1953 to continue their advertising campaign for another year, according to the October 10 Fish Trades Gazette, a British trade magazine. Special effort will be directed towards the sale of cod and cod fillets and the estimated cost is in the vicinity of £50,000 (US\$140,000).

The Federation also agreed to contribute towards the expense of the hydrographic survey shortly to be undertaken by the White Fish Authority at a cost of £16,000 to £17,000 (US\$44,800-45,600).

The British Treasury is also contributing towards the cost of the trip. Already the White Fish Authority chartered the British trawler Sletnes, which was scheduled to sail in mid-October.

In its last annual report, the WFA stated that it was difficult to get cooperation from various sections of the fishing industry to provide figures of costs and profits.

The Federation has decided that it shall not be liable to criticism on this score. Directors of the distant-water section have offered the WFA facilities to inspect the accounts of more than 300 distant-water vessels for a period covering the most recent two-year period.

The meeting also considered the bringing into operation of the 1946 North Sea Over-Fishing Convention. It is the Federation's view that the provisions laid down by the Convention must not be altered in any way before they are due to become effective in April 1954. It considers that in the interests of conservation the mesh sizes agreed upon in

1946 and subsequently affirmed at the first meeting of the signatory countries, after all had ratified the Convention, should not be modified in any way. This course should be maintained until the permanent commission has had an opportunity of considering the effects of the agreed provisions upon the fish stock.

* * * * *

FISHING VESSELS SOLD TO WEST GERMANY: A fleet of 48 fishing vessels has been sold to West Germany by the British Government, reports the October 31, 1953, issue of The Fishing News, a British trade magazine. These vessels are the so-called "war cutters" captured from Germany during World War II presently being used by the German fisheries in the Baltic. They were originally naval vessels, but after 1945 the British authorities chartered them to Germans to help build a new German fishing fleet.

The German Ministry for Economic Affairs granted a loan of about £100,000 (US \$280,000) to finance the purchase. The German authorities plan to resell the vessels to individual fishermen.

The vessels are to be modernized at an additional cost of about £100,000 (US \$280,000). Motors are to be improved, and among other things the vessels will be equipped with new echo sounders.

Apart from the 48 British vessels, the German Baltic fisheries are using about 25 ex-United States naval vessels. Whether the Germans will buy these vessels is not clear.

* * * * *

FROZEN WHALE MEAT PRODUCTION, 1952/53: Production of frozen whale meat on United Kingdom whaling vessels was estimated at 5,000 metric tons for the 1952/53 season, reports a May 20 U. S. Embassy dispatch from London. Almost the entire output was on the Balaena^{1/} which produced 4,845 tons compared with 2,530 tons in 1951/52. This meat is mostly consumed as animal food.

Several years ago the British whaling expeditions made an effort to place whale meat on the United Kingdom market for human consumption and produced a substantial quantity of frozen and canned whale meat. The poor reception to the product and the problems associated with producing meat suitable for human consumption resulted in abandoning this type of production. Although there is a large amount of protein food potential available in whale meat, consumer acceptance of this food in the United Kingdom is very limited and so far it has not proved profitable for the companies to produce it. With an improving supply of conventional meats, the prospects for greater use are limited. The small supply of whale meat used for human consumption in the United Kingdom now originates from land stations in Norway and Iceland.

United Kingdom imports^{2/} of humanly edible and other frozen whale meat in 1952 amounted to 7,700 metric tons, compared with 6,270 tons in 1951. The bulk of this was used for animal food.

^{1/}OTHER PRODUCTS PRODUCED BY THE BALAENA WERE 4,215 METRIC TONS OF DRIED MEAT AND LIVER MEALS, COMPARED WITH 3,569 IN 1951/52; LIVER OIL 30 TONS, COMPARED WITH 29 TONS; MEAT EXTRACT 134 TONS, COMPARED WITH 53 TONS.

^{2/}INCLUDING PRODUCTION OF UNITED KINGDOM EXPEDITIONS.



Venezuela

FISHERIES PRODUCTION AND IMPORTS, JANUARY-JUNE 1953: Production:

The total production of fishery products in Venezuela during the first six months of

Table 1 - Venezuelan Fishery Products Production (Product Weight), January-June 1953 and Year 1952

	January-June		Year 1952
	1953	1952	
	(Metric tons)		
Fresh ..	19,409	19,489	31,867
Salted ..	5,948	5,469	10,200
Canned ..	5,747	5,642	7,487
Total ..	31,104	30,600	49,554

1953 on the basis of product weight amounted to 31,104 metric tons (table 1), reports an October 5 U. S. Embassy dispatch from Caracas. This is a 2-percent increase when compared with the 30,600 tons produced in the similar period of 1952. Total production in 1952 amounted to 49,554 metric tons.

Supplies of fishery products in Venezuela are ample for the demand. Canned fish was considered to be in surplus supply in 1952.

Imports: Venezuelan imports of fishery products during the January-June 1953 period amounted to 806 metric tons (table 2), valued at 2,284,506 bolivares (US\$681,940). Leading items imported into Venezuela were cod (bacalao), tuna, and salmon, in that order.

Table 2 - Venezuelan Imports of Fishery Products, January-June 1953 and Year 1952

Species	Imports From All Countries									Imports From the United States		
	January-June 1953			Year 1952			January-June 1953					
	Quantity		Value	Quantity		Value	Quantity		Value			
	Tons	Bolivares	US\$	Tons	Bolivares	US\$	Tons	Bolivares	US\$			
Cod (bacalao), salted	316	642,552	191,836	480	931,559	278,077	27.5	74,888	22,294			
Cod (bacalao), unsalted	6	18,270	5,454	13	30,650	9,149	1.2	2,642	789			
Herring, salted	10	13,111	3,914	24	30,752	9,180	4.3	7,629	2,277			
Herring, other	14	23,453	7,000	40	54,775	16,351	9.9/	17,785	5,309			
Salmon, unsalted	132	337,613	100,780	174	536,339	160,101	74.2/	224,627	67,053			
Sardines, salted	2	2,931	875	13	18,144	5,418	-	-	-			
Sardines, other	8	22,249	6,641	522	615,889	183,845	3.8/	11,958	3,570			
Tuna, except dried and salted	163	545,757	162,912	265	909,175	271,396	42.0/	146,619	43,787			
Caviar	1	32,154	9,598	2	55,494	16,565	.5	7,777	2,321			
Miscellaneous fish, salted ..	21	75,061	22,406	73	482,549	144,044	11.8	50,808	15,167			
Miscellaneous fish, unsalted	71	253,983	75,916	186	624,628	185,456	19.5/	46,440	13,863			
Miscellaneous shellfish	62	317,272	94,708	125	621,668	185,572	38.2	177,221	52,902			
Total	806	2,284,506	681,940	1,897	4,911,622	1,466,150	232.9	768,194	229,312			

1/PROBABLY MOSTLY CANNED.

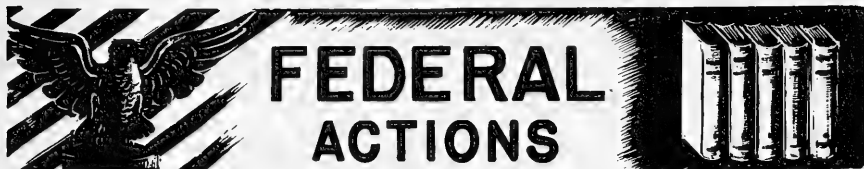
United States shipments of fishery products to Venezuela in the first six months of 1953 totaled 233 metric tons, valued at 768,194 bolivares (US\$229,312). The largest item was salmon (74.2 metric tons), followed by tuna (42.0 tons), and salted cod (27.5 tons).



INFRARED DRYING OF FISH IS TOO EXPENSIVE

Comparison of fish drying by means of infrared lamps, hot air, and sunlight showed that infrared drying is practicable but uneconomical for low-priced products, according to Japanese experiments.

--World Fisheries Abstracts, March-April 1953.

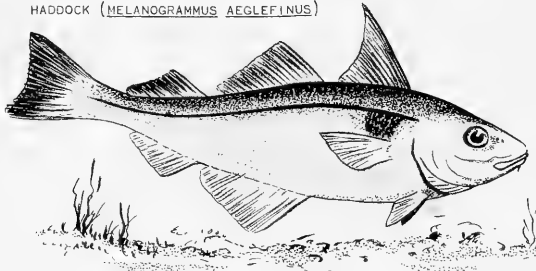


Department of the Interior

FISH AND WILDLIFE SERVICE

REVISED HADDOCK FISHING REGULATIONS FOR NORTHWEST ATLANTIC: Revised haddock fishing regulations for United States vessels operating in the Northwest

HADDOCK (*MELANOGRAMMUS AEGLEFINUS*)



Atlantic Convention area entered into force on January 1, 1954. The revised regulations incorporate changes proposed by the International Commission for the Northwest Atlantic Fisheries at its Third Annual Meeting in New Haven, Conn., May 25-30, 1953.

The new regulations as published in the Federal Register of December 31, 1953, follow:

Subchapter I—Northwest Atlantic Commercial Fisheries

PART 155—HADDOCK PROVISIONS

Basis and purpose. At its Third Annual Meeting held in New Haven, Connecticut, May 25-30, 1953, the International Commission for the Northwest Atlantic Fisheries, a body created pursuant to Article II of the International Convention for the Northwest Atlantic Fisheries signed at Washington, D. C., under date of February 9, 1949, adopted a proposal amending a proposal previously adopted by the Commission concerning the regulation of the taking of haddock in Sub-area 5 of the Convention Area. The proposal adopted at the Third Annual Meeting recommends certain changes in the definition of average mesh size in trawl nets when wet after use and authorizes the Contracting Governments to exercise discretion in determining such average mesh size.

On September 1, 1953, the proposal was accepted by the Governments of the United States and Canada, and, in accordance with the provisions of the International Convention for the Northwest Atlantic Fisheries, enters into force with respect to all Contracting Governments on January 1, 1954.

In accordance with section 4 (a) of the Northwest Atlantic Fisheries Act of 1950 (64 Stat. 1067, 16 U. S. C., 1946 ed., Supp. V, 986) regulations proposed by the Secretary of the Interior to implement the proposal were submitted to the Advisory Committee to the United States Commissioners on the International Commission for the Northwest Atlantic Fisheries on November 10, 1953, at which time the proposed regulations received the approval of the Committee.

By notice of proposed rule making published in the FEDERAL REGISTER on December 2, 1953 (18 F. R. 7658), the public was invited to submit written data, views or arguments in connection with the proposed regulations to Mr. John L. Farley, Director, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C., not later than 30 days from the publication of the notice in the FEDERAL REGISTER. Careful consideration has been given the views, data and arguments received, and it has been determined that the regulations appearing below should be promulgated to govern the use of trawling nets in the haddock fishery in the area described in the said regulations.

Beginning about September 1, 1953, the proposed regulations were discussed

and formulated in a series of meetings with the representatives of the fishing industry affected, and the text of the proposed regulations was included in the notice of proposed rule making published December 2, 1953. Existing regulations covering the same subject matter expire on December 31, 1953, and the new regulations must become effective January 1, 1954, in order to comply with the action on May 25-30, 1953, of the International Commission for the Northwest Atlantic Fisheries. In these circumstances, it has been determined that it is both appropriate and necessary to waive the 30-day period between the date of publication and the effective date of the regulations.

Effective January 1, 1954, the following regulations, replacing Subchapter I—Northwest Atlantic Commercial Fisheries, Part 155—Haddock Provisions, are prescribed:

- Sec.
155.1 Meaning of terms.
155.2 Restrictions on fishing gear.
155.3 Tampering with seals prohibited.
155.4 Employment of devices to reduce mesh size prohibited.
155.5 Certain vessels exempted.

AUTHORITY: §§ 155.1 to 155.5 issued under sec. 7, 64 Stat. 1067; 16 U. S. C. 966.

§ 155.1. *Meaning of terms.* When used in the regulations in this part, unless the content otherwise requires, terms shall have the meanings ascribed hereinafter in this section.

(a) *Vessel.* The word "vessel" denotes every kind, type, or description of watercraft, aircraft, or other contrivance, subject to the jurisdiction of the United States, and, or capable of being used, as a means of transportation on water.

(b) *Haddock.* The word "haddock" denotes any fish of the species *Melanogrammus aeglefinus*.

(c) *Haddock fishing.* The words "haddock fishing" mean the catching, taking, or fishing for, or the attempted catching, taking, or fishing for any fish of the species *Melanogrammus aeglefinus*.

(d) *Trawl net.* The words "rawl net" mean any large bag net dragged in the sea by a vessel or vessels for the purpose of taking fish.

(e) *Cod end.* The words "cod end" mean the bag-like extension attached to the after end of the belly of the trawl net and used to retain the catch.

§ 155.2. *Restrictions on fishing gear.* (a) No person shall engage in haddock fishing in the northwest Atlantic Ocean north of 39°00' north latitude and west of 42°00' west longitude with a trawl net or nets, parts of nets or netting having a mesh size of less than four and one-half inches, as defined in this section.

(b) As used in this section, the term "mesh size of less than four and one-half inches" shall mean: (1) With respect to any part of the net except the cod end, the average size of any twenty consecutive meshes in any row laced at least ten meshes from the side lacing measured when wet after use, and (2) with respect to the cod end, the average size of any row of meshes running the length of the cod end located at least ten meshes from the side lacing, measured when

wet after use, or, at the option of the user, a cod end which has been approved, in accordance with paragraph (d) of this section, by an authorized representative of the Director of the Fish and Wildlife Service, as having a mesh size when dry before use equivalent to not less than four and one-half inches when wet after use.

(c) All measurements of meshes when wet after use shall be made by the insertion into such meshes under pressure of not less than ten nor more than fifteen pounds of a flat, wedge-shaped gauge having a taper of two inches in nine inches and a thickness of three thirty-seconds of an inch.

(d) For the purpose of approving dry cod ends before use, as contemplated by paragraph (b) of this section, the average mesh size of such cod ends shall be determined by measuring the length of any single row of meshes running the length of the cod end, parallel to the long axis of the cod end and located at least ten meshes from the side lacing, when stretched under a tension of two hundred pounds, and dividing the length by the number of meshes in such row: *Provided*, That not more than ten percent of the meshes in such row shall be more than one-half inch smaller when measured between knot centers than the average of the row. Cod ends so measured which are constructed of the twines and are of not less than the average mesh sizes specified in the table below may be approved for haddock fishing by any duly authorized employee of the Fish and Wildlife Service by the attachment to such cod end of an appropriate seal or seals.

Twine	Average mesh size
4-ply 45-yard manilla, double strand.	5.625 inches (5 $\frac{1}{4}$ ")
4-ply 50-yard manilla, double strand.	5.625 inches (5 $\frac{1}{4}$ ")

* * * * *

Twine	Average mesh size
4-ply 75-yard manilla, double strand.	5.625 inches (5 $\frac{1}{4}$ ")
4-ply 80-yard manilla, double strand.	5.500 inches (5 $\frac{1}{2}$ ")
109-thread cotton	4.250 inches (4 $\frac{1}{4}$ ")
All nylon	4.250 inches (4 $\frac{1}{4}$ ")

§ 155.3. *Tampering with seals prohibited.* Removing, altering, defacing or in any other way tampering with seals affixed to cod ends in accordance with § 155.2 is prohibited.

§ 155.4. *Employment of devices to reduce mesh size prohibited.* The use from any vessel engaged in haddock fishing in the area described in § 155.2 of any device or method which will obstruct the meshes of the trawl net or which will otherwise, in effect, diminish the size of said meshes is prohibited: *Provided*, That a protective covering may be attached to the underside only of the cod end alone of the net to reduce and prevent damage thereto.

§ 155.5. *Certain vessels exempted.* Nothing contained in the regulations in this part shall apply to:

(a) Any vessel having in possession haddock in amounts less than five thousand pounds or ten percent by weight of all the fish on board such vessel, whichever is larger.

(b) Any vessel duly authorized by the Director of the Fish and Wildlife Service to engage in haddock fishing for scientific purposes.

(c) Any vessel documented as a common carrier by the Government of the United States and engaged exclusively in the carriage of freight and passengers.

Dated: December 24, 1953.

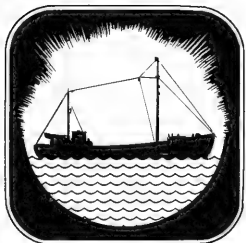
RALPH A. TUDOR,
Acting Secretary of the Interior.

CERTIFICATION OF COD ENDS UNDER NORTHWEST ATLANTIC HADDOCK FISHING REGULATIONS:

Under the haddock regulations issued by the U. S. Fish and Wildlife Service (see pp. 59-60) in accordance with the provisions of the International Convention for the Northwest Atlantic Fisheries, Service officials are authorized to approve cod ends for use in haddock fishing in the area covered by the regulations. Members of the Branch of Commercial Fisheries who have been authorized to certify cod ends having a mesh of the size specified in the regulations are as follows:

Rockland, Maine	- Churchill T. Smith
Boothbay Harbor, Maine	- David A. McKown
Portland, Maine	- George R. Nichols
Boston and Gloucester, Mass.	- Charles H. Lyles, Homer Haberland, & R. H. Marchant
New Bedford, Mass.	- George W. Snow
Provincetown, Mass.	- Francis Riley

* * * * *



SUOMELA SWORN IN AS ASSISTANT DIRECTOR: Arnie J. Suomela of Portland, Oregon, was sworn in as Assistant Director of the Fish and Wildlife Service on January 11, 1954. Secretary of the Interior McKay had announced Suomela's appointment to the position on November 27, 1953.



LEFT TO RIGHT: CHIEF CLERK FLOYD E. DOTSON, SECRETARY OF THE INTERIOR DOUGLAS MCKAY, ASSISTANT DIRECTOR OF FISH AND WILDLIFE SERVICE ARNIE J. SUOMELA.

Since 1945 the new Federal official has been Oregon State Director of Fisheries. He is considered one of the Nation's authorities on the salmon fishery, and has done extensive research in Alaska and the Pacific Northwest on this subject.



Interstate Commerce Commission

UNFETTERED TRIP LEASE OF "EXEMPT" TRUCKS PERMITTED: "Exempt" trucks are excluded from ICC rules which require truck leases to be for a period of not less than 30 days, according to a recent order by the Interstate Commerce Commission amending a previous order issued in connection with its Docket MC 43. This action means that truckers carrying exempt commodities (including fresh and frozen fishery products) can continue to lease their equipment to regulated carriers for return movements, thus avoiding empty mileage. This is an important ruling for the fishery industries since they utilize "exempt" trucks for shipping fishery products.

Vehicles may be leased to another carrier following an exempt movement. There may be one return movement in any direction or in one of a series of loaded movements in the general direction of the point from which the exempt movement originated or from the carrier's home base. The only requirement is that the leasing carrier receive

a statement from the owner of the leased vehicle authorizing the driver to lease the equipment and a statement from the driver as to the origin, destination, and time of beginning and ending of last exempt movement.

The provisions of the current outstanding order which regulate the compensation and duration of leases for all other motor vehicles subject to the Commission's jurisdiction have been postponed by the Commission until March 1, 1955. This was done in conjunction with an order reopening the proceeding for reconsideration of the 30-day and compensation requirements.



Eighty-Third Congress (Second Session)

JANUARY 1954

The Second Session of the Eighty-Third Congress commenced on January 6, 1954. Listed below are public bills and resolutions introduced and referred to committees or passed by the Eighty-Third Congress (Second Session) and signed by the President that directly or indirectly affect the fisheries and allied industries. Public bills and resolutions are shown in this section only when introduced and, if passed, when signed by the President; but also shown are the more pertinent reports, hearings, or chamber actions on some of the bills shown in this section from month to month.

DISTRIBUTION OF FISHERY PRODUCTS: S. 2802 (Saltonstall, Kennedy, and 27 other senators), a bill to further encourage the distribution of fishery products, and for other purposes. Introduced in the Senate on January 22 and referred to the Committee on Merchant Marine and Fisheries. The bill provides that:

The Secretary of Agriculture shall transfer to the Secretary of the Interior each fiscal year, beginning with July 1, 1954, from moneys made available to carry out the provisions of section 32 of such Act of August 24, 1935, an amount equal to 30 percent of the gross receipts from duties collected under the customs laws on fishery products (including fish, shellfish, mollusks, and crustacea), which shall be maintained in a separate fund and used by the Secretary of the Interior (1) to pro-

vide the free flow of domestically produced fishery products in commerce by conducting a fishery educational service and fishery technological, biological and related research programs, the moneys so transferred to be also available for the purchase or other acquisition, construction, equipment, operation, and maintenance of vessels or other facilities necessary for conducting research as provided for in this section, and (2) to develop and increase markets for fishery products of domestic origin.

In introducing S. 2802, Senator Saltonstall described it as "a bill designed to revitalize the Nation's domestic fishing industry." Senator Saltonstall for himself and Senator Kennedy presented a summary of the bill which was printed in the January 22 Congressional Record, as follows:

SCOPE AND PURPOSE OF THE SALTONSTALL-KENNEDY FISHERIES BILL

The fishing industry throughout the United States is in an increasingly difficult position. Decreased catches, depletion of fishing grounds, and a lack of improved techniques have all harmed the basic American industry. Rising imports have subjected it to particularly severe pressure.

In 1953, the domestic fishing industry caught 4.3 billion pounds of fish and shellfish worth more than \$355 million. Directly and indirectly, the industry employed 550,000 people. As a means of overcoming its difficulties, the basic recommendation of all recent studies, including those authorized by the Congress, is an increase in research and development activities. The fishing industry, however, is one composed of individuals and small companies lacking the resources necessary to carry on these activities on a long-term basis. These recent studies have accordingly made the further recommendation that needed research and development projects be carried on by the Fish and Wildlife Service of the Department of the Interior. For this purpose, additional funds will be needed.

Because the difficulties of the industry so largely stem from competition by imports, the most appropriate source of additional funds for this purpose is the revenue derived from those same imports. Under existing law, however, the only portion of import revenues not turned over to the general Treasury goes to the Department of Agricul-

culture. The law making these funds available to the Department of Agriculture is section 32 of the act of August 24, 1935, which there is appropriated and made available to the Secretary of Agriculture for each fiscal year an amount equal to 30 percent of the gross receipts from duties collected under the customs laws during the preceding calendar year. The Secretary is directed to use these funds to subsidize the export of agricultural commodities, and to make purchases of such commodities, and to make production payments to farmers. His only authority to use any part of these funds for the benefit of the domestic fishing industry derives from the act of August 11, 1939.

The 1939 act authorizes the Secretary of Agriculture to use not more than \$1,500,000 per year of section 32 funds to purchase and divert surplus fishery products for distribution through relief channels. It also permits him to transfer to the Secretary of the Interior \$75,000 to conduct a fishery educational service and \$100,000 to develop and increase markets for fishery products of domestic origin. In practice, the authority to purchase surplus fishery products has never been used. Although in recent years the funds for a fishery educational service and for market development have been regularly transferred.

Since enactment of the act of 1939, however, gross receipts from duties on fishery products have increased enormously. In 1940 the total amount was \$4,772,428; by 1952 it had increased to \$11,982,000, an increase

of more than 250 percent. During this same period the value of fishery imports increased from \$40 million to over \$200 million. The domestic industry, in the meantime, by voyaging farther and farther afield at greater and greater expense for every pound of fish caught, has barely managed to hold the share of the market it had at the beginning of the period.

It is thus evident that during a period when the domestic fishing industry has been increasingly in need of assistance in meeting competition from abroad, it has been making increasingly large indirect contributions for purposes unrelated to this need. The proposed bill is aimed at correcting this plainly unfair situation.

To accomplish this the bill would require the Secretary of Agriculture to transfer to the Secretary of the Interior every year from the funds made available under the act of August 24, 1935, that portion derived from the duties on fishery products. The Secretary of Agriculture would still retain power to make support purchases of surplus fishery products under section 1 of the 1939 act should it ever be deemed desirable to exercise this authority. The Secretary of the Interior would have power under section 2 (4) to retransfer funds made available under the proposed bill to the Department of Agriculture for this purpose.

The remaining funds (ordinarily the entire amount) would be used by the Secretary of the Interior to conduct a fishery educational service and fishery research programs and to

develop and increase markets for fishery products of domestic origin. In carrying out these programs the Secretary of the Interior would cooperate with other agencies of the Federal, State, and local governments and with interested private organizations and individuals.

Such functions are, of course, appropriately within the jurisdiction of the Federal Government and are seriously required at the present time. To finance them out of section 32 funds would benefit the fishing industry without any sacrifice to agricultural research. The funds available to the Department of Agriculture under section 32 during recent fiscal years have been in the following total amounts:

1950.....	\$125,600,000
1951.....	111,000,000
1952.....	159,000,000
1953.....	181,000,000
1954.....	172,000,000
1955 (estimated).....	180,000,000

The Agricultural Act of 1949 provides for an accumulation of section 32 funds by the Department of Agriculture up to a total of \$500 million. Any excess over this amount must be turned back by the Department of Agriculture to the Department of the Treasury. In fiscal 1954, \$27 million has been turned back—a sum, in other words 7 or 8

times the total which would be made available to the Department of the Interior under the proposed bill to meet the research and development needs of the fishing industry.

In the field of biological and oceanographic research, the most urgent need is to explore the reasons for fluctuations in the supply of fish. Reports from the Great Lakes, Alaska, and the Pacific States, and from all along the Atlantic coast from the Grand Banks to Mexico, confirm the importance of stability of supplies in establishing new markets for fishery products. Hope for overcoming this problem lies in research on ocean currents, changes in water temperature, abundance of fish food, and other shifting conditions. With present knowledge it is impossible to distinguish fluctuations in abundance from fluctuations in accessibility and to advise fishermen accordingly.

In the technological field, development could be undertaken of chemical tests for freshness of chilled and frozen fish and shellfish so as to provide means for control of quality. Study could be initiated of methods of freezing shrimp at sea in the Gulf of Mexico area to prevent spoilage. Methods might also be found of handling, freezing, and packaging Southern oysters to broaden the market beyond the now purely local distribution of the fresh product.

To develop and increase markets for fishery products, much more data than is now being collected would be helpful in determining the proper utilization of our salt-water and fresh-water fishery resources. Receipts and wholesale prices could be collected in eight large consuming cities (Philadelphia, Baltimore, Cleveland, Detroit, St. Louis; St. Paul, Los Angeles, and Pittsburgh) not now covered by the Market News Service. Surveys could usefully be made, too, of the distribution of fishery products in New York and Chicago in order to determine the changes in marketing since the advent of frozen packaged fish and shellfish products.

Among the educational projects beneficial to the industry which a lack of funds precludes at this time is the development of new uses for the underdeveloped and less popular species, both fresh-water and salt-water, so as to provide year-round employment and stabilize market prices for the fishermen, processors, marketers, and consumers of domestically produced fishery products.

Many other examples could be cited of projects beneficial to the fishing industry which the funds provided for in the enclosed bill may eventually make possible. Those mentioned, however, should serve to make clear that the need is great, and adoption of the means of meeting it provided for in the proposed bill would be a long step forward.

H. R. 7441 (Knox), a bill to further encourage the distribution of fishery products, and for other purposes (similar to S. 2802) was introduced in the House on January 21 and referred to the Committee on Merchant Marine and Fisheries.

HAWAII AND ALASKA STATEHOOD: Senate Committee on Interior and Insular Affairs on January 19 in executive session voted to approve S. 49, to provide statehood for Hawaii.

The committee also voted to add a new title II to this bill, which would include the Anderson version of H. R. 2982, providing statehood for Alaska. The chairman announced, however, that the new title II has been submitted to the Subcommittee on Territories and Insular Affairs for perfecting changes, a draft of which will be reported back to the full committee within the next few days in order that the bill may be reported to the Senate.

On January 27 the Senate Committee on Interior and Insular Affairs in executive session ordered favorably reported with

amendments S. 49, providing statehood for Hawaii (S. Rept. 886). Prior to approval of this bill, the committee, by a vote of 8 to 7, adopted a motion to reconsider the vote by which title II, providing statehood for Alaska, was attached to S. 49.

Following these actions, the committee unanimously agreed that the Alaska bill (S. 50) will be voted on by the committee not later than February 4, and that a meeting be held not later than February 3 for the purpose of marking up this bill.

WATER POLLUTION CONTROL: On January 14 Representative Bailey introduced two bills on water pollution control—H. R. 7168, a bill to extend the duration of the Water Pollution Control Act, to authorize additional amounts for construction loans thereunder and for other purposes; to the Committee on Public Works; and H. R. 7170, a bill to encourage the prevention of stream pollution by providing an amortization deduction for facilities built to treat industrial wastes; to the Committee on Ways and Means.

NEW BRITISH FILLET SKINNING MACHINE

A fillet skinning machine has been patented in the United Kingdom in which the fish fillet is drawn past a knife. The knife is first moved to cut perpendicularly through the meat close to the skin and is then inclined to cut between the skin and the meat. The end of the fillet is cut between a small and large roller, the skin of the fillet being towards the larger roller, and the knife being maintained at a constant distance from the larger roller. The fillet is drawn between the rollers. The method is said to be applicable to skinning of flat fish, such as plaice, before filleting.

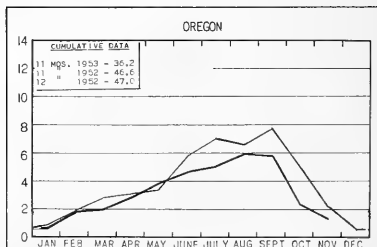
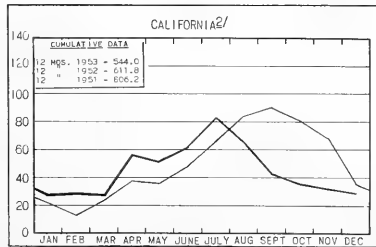
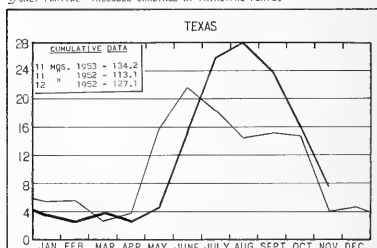
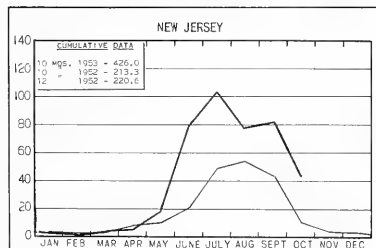
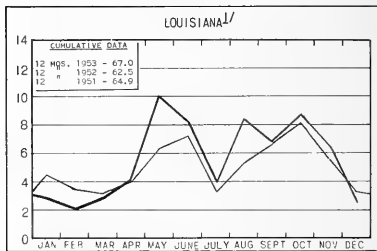
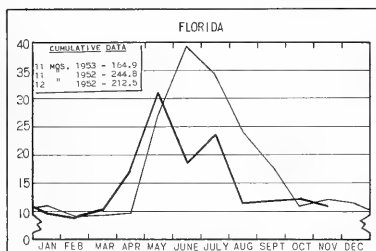
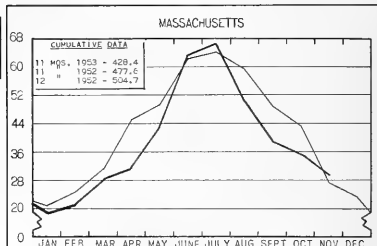
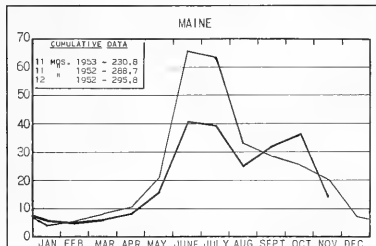
--Food Manufacture, June 1953.





CHART I - FISHERY LANDINGS for SELECTED STATES

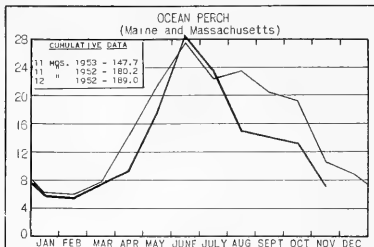
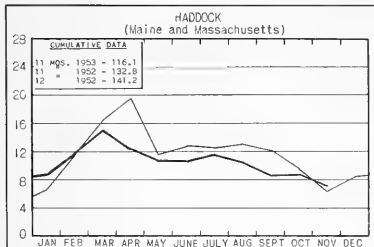
In Millions of Pounds



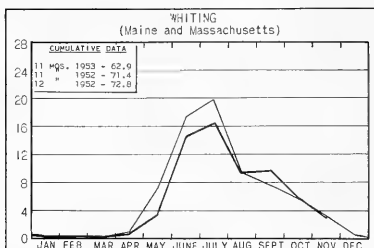
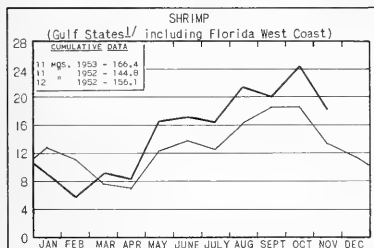
^{2/}ONLY PARTIAL--INCLUDES PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

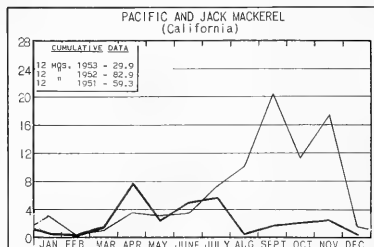
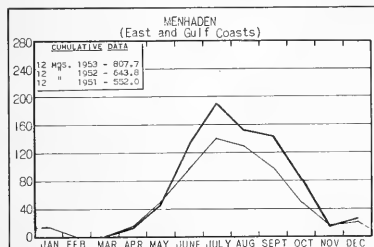


In Millions of Pounds



LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

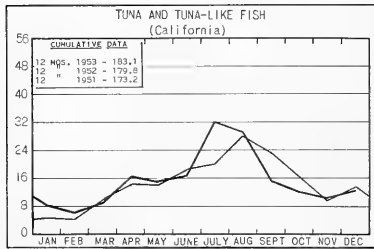
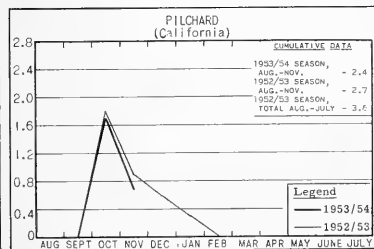
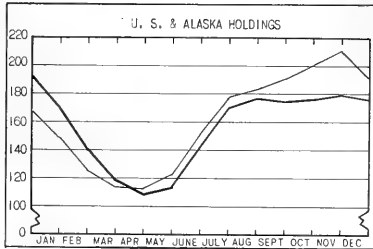
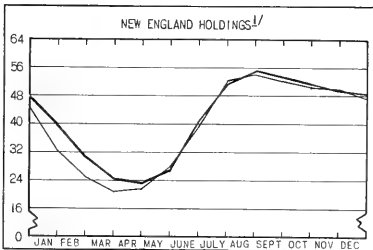
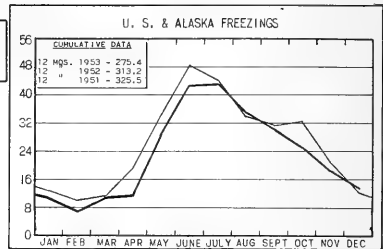


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

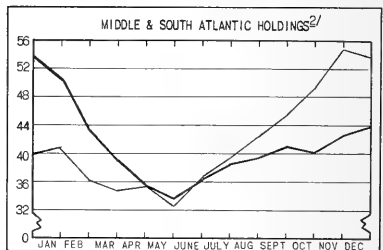
In Millions of Pounds



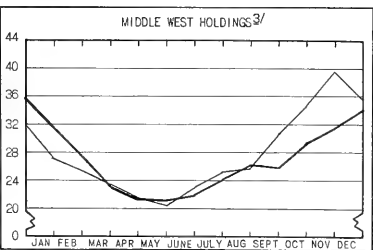
Legend:
— 1953
— 1952



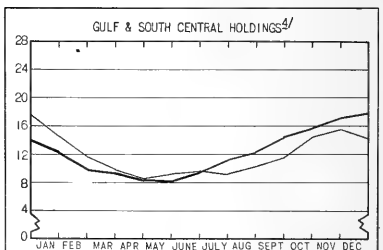
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.



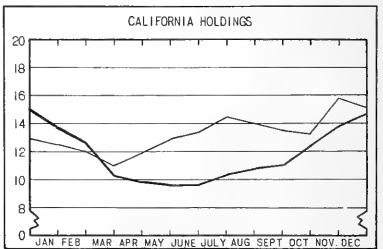
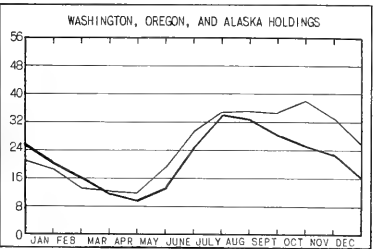
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR., & KANS.



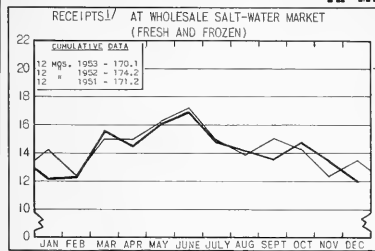
^{4/}ALA., MISS., LA., TEX., ARK., KT., & TENN.



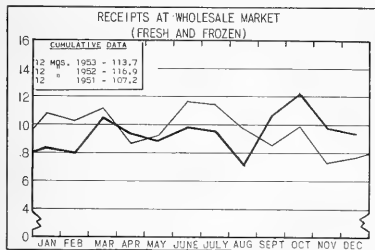
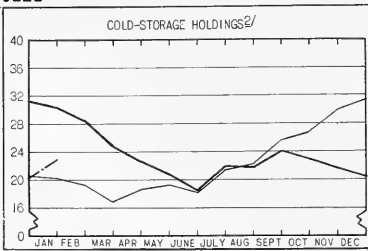
*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

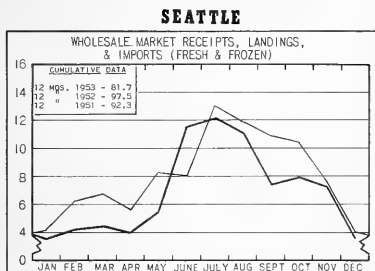
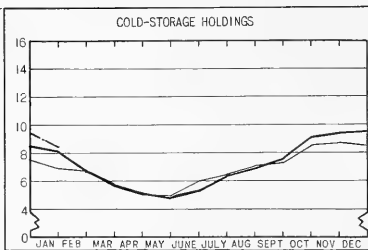
In Millions of Pound



NEW YORK CITY



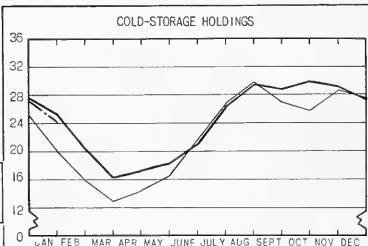
CHICAGO



SEATTLE

Legend

- - - 1954
- 1953
- 1952



BOSTON

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

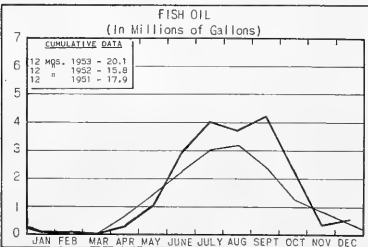
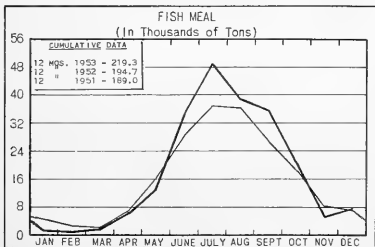
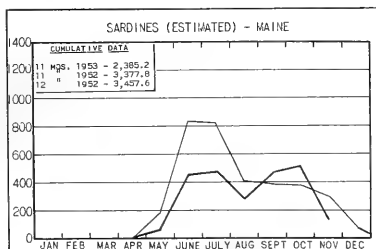
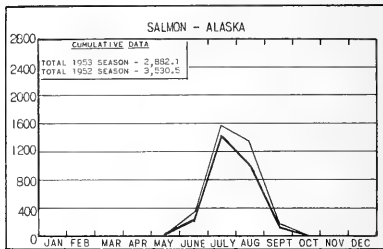
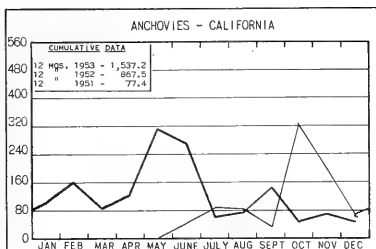
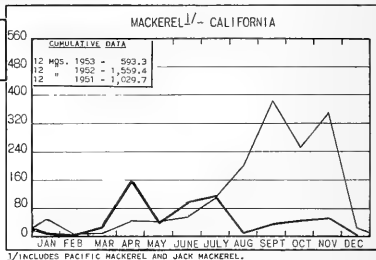
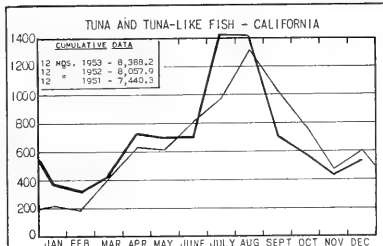


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	$\frac{1}{4}$ drawn	3 $\frac{3}{4}$ oz.
SHRIMP	48	—	5 oz.
TUNA	48	No. $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	$\frac{1}{2}$ lb.	8 oz.

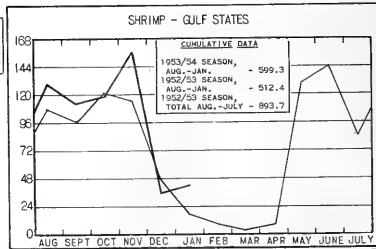
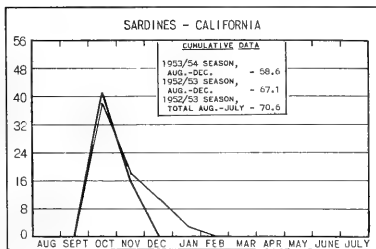
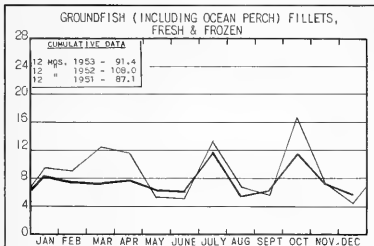
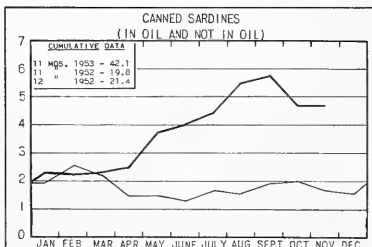
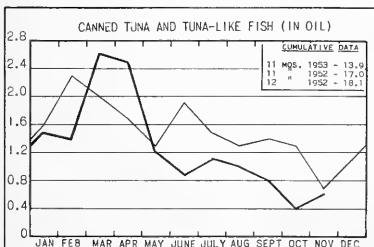
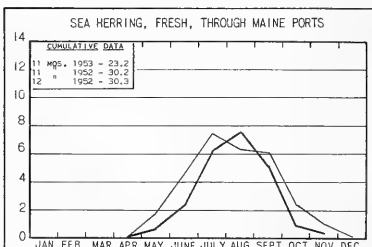
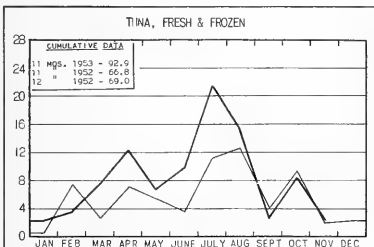
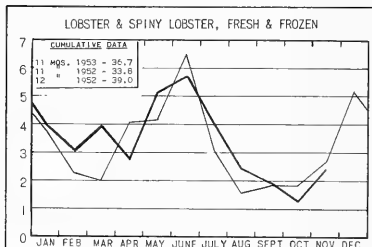
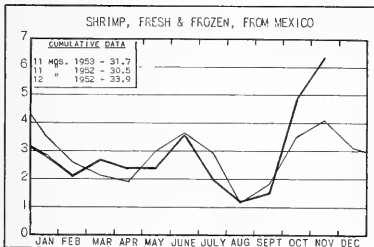
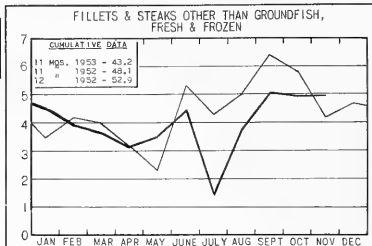


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



Legend:
— 1953
- - - 1952





RECENT FISHERY PUBLICATIONS

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, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SSR.-FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP.-SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|---------------------|---|
| CFS-932 - | Frozen Fish Report, November 1953,
8 p. |
| CFS-933 - | Mississippi Landings, September 1953,
2 p. |
| CFS-934 - | New Jersey Landings, September 1953,
2 p. |
| Sep. No. 363 - | Fishing Vessel Live-Bait Equip-
ment. |
| Sep. No. 364 - | Salt Content of Salmon Canned from
Brine-Frozen Fish. |
| SSR-Fish. No. 105 - | Length Composition of Cali-
fornia Commercial Catch of Pilchard, 1919-51,
by Margaret M. Calderwood, 83 p., processed,
September 1953. Data contained in this paper
have been compiled from source files and are
presented for use by fishery scientists for study
of complex relationships which exist between
age classes of a pelagic fishery. Presents a
series of tables which represent the length com-
position, so far as obtainable, of the commer-
cial catch of sardines, <i>Sardinops caerulea</i>
(Girard) 1854, in California from the 1919/20
season through the 1950/51 season. |
| SSR-Fish. No. 111 - | Attempts to Guide Small Fish
with Underwater Sound, by Clifford J. Burner |

and Harvey L. Moore, 43 p., illus., processed, September 1953. A resume of what has been accomplished in attempting to guide fish by means of subaqueous sonic vibrations. It discusses the characteristics of sound and sound devices, and the equipment and methods of measuring the reaction of fish to sound. The conclusions in part were:

Guiding fishes by means of sound-generating equipment installed at dams and diversions would be desirable because of its freedom from physical floating equipment and ease of maintenance. Fishes have been conditioned to respond to sound as a signal for food, but the evidence of attraction to sound alone is rare and questionable. Certain fishes may be frightened momentarily by any noise, but adjust to disregard it (become conditioned) almost instantaneously. A total of 90 planned tests were made in addition to a number of exploratory and informal tests. Contingency tests applied to the data show the resulting distributions of control and sound tests to be significantly different. However, at no time did a sound frequency or intensity influence the action of trout enough to be utilized in guiding young salmon into safe passages around dams and diversions.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

"A Century of American Fish Culture, 1853-1953," by Edward M. Wood, article, pp. 147-62. (From *The Progressive Fish Culturist*, vol. 15, no. 4, October 1953, processed, annual subscription \$1.25 domestic, US\$1.65 foreign.) A brief historical review of the progress in fish culture during the last 100 years. Developments in artificial propagation as applied to commercial fisheries, sport or game fisheries, fish cultural research, and fishery management are described. Also contains a long list of literature citations.

Indexes of Transportation Rates for Fishery Products, by Morton J. Garfield, Circular 23, 15p., printed, 10 cents, 1953.

This circular traces the history of transportation rates for rail freight and railway express shipments of fishery products from 1939 through 1952 and motor carrier shipments of fishery

products from 1947 through 1952. It furnishes data with respect to the transportation rate trends in various categories of fishery products, such as canned fish, fresh and frozen fish, and fish meal and oil. A rather short and to the point text gives a general over-all picture of the competitive situation with respect to the various types of carriers.

Data with respect to transportation rates for fishery products are presented in the form of index numbers. The base year for the several series of index numbers is 1947, and the index numbers reflect percentage changes above or below the level of rates which prevail in that year. Although actual rates for the various routes included in the survey are available in the files of the U. S. Fish and Wildlife Service, they are not shown in this report, since the objective was to reflect only changes in rates over a period of many years.

-W. H. Stolting

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

The American Smelt, OSMERUS MORDAX (Mitchill), of South Bay, Manitoulin Island, Lake Huron, by N. S. Baldwin, 5 p., illus., printed. (Reprint from Transactions of the American Fisheries Society, vol. 78 (1948), pp. 176-180.) Fisheries Research Section, Department of Lands and Forests, Southern Research Station, Maple, Ontario, 1950. A smelt fishery established on the streams and freshets flowing into South Bay during the 1948 spawning run yielded a total of 51,382 pounds to local fishermen using dip nets and seines. The smelt taken averaged 5.7 inches in fork length and 0.73 ounce in weight. Age-group II comprised 54 percent of the catch and age-groups III and IV, 38 and 8 percent, respectively. Age-group II averaged 5.4 inches in length; age-group III, 6.1 inches, and age-group IV, 7.2 inches. The estimated egg content in five fish ranged from 9,650 to 27,600 and was not entirely dependent on size. Some general observations on the food and spawning behavior of the smelt are also presented and comparisons made with other populations.

Analysis of Factors Affecting the Production of Chum Salmon (CORHYNCHUS KETA) in Tillamook Bay, by Kenneth A. Henry, Contribution No. 18, 37 p., illus., printed. Fish Commission of Oregon, Portland, Oregon, September 1953. This paper deals with the factors affecting the production of chum salmon. It is quite important in the proper management of any fishery to have a thorough understanding of the relative importance of the various factors affecting the production of the fishery and then, if possible, to isolate the factor, or factors, which appear to have the greatest influence on the resulting production. It was the search for some method of predicting the yearly production of chum salmon that provided the basis for this study. This report includes a brief resume of the commercial salmon fishery on Tillamook Bay, particularly regarding the magnitude of the catches. It summarizes briefly the life history of the chum salmon and the factors affecting production. Also discusses an attempt to discover some means of predicting the size of the chum salmon run returning to the spawning grounds each year.

The Bottom Fauna of Louisa and Redrock Lakes, Algonquin Park, Ontario, by Kenneth G. Wood, 10 p., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 82 (1952), pp. 203-212.) Fisheries Research Section, Department of Lands and Forests, Southern Research Station, Maple, Ontario, 1952. Bottom-fauna surveys of Louisa and Redrock Lakes were carried out to supplement previous investigations of the fisheries. The average weight per animal and the depth distribution of the various organisms are discussed. Migrations of Chaoborus larvae are demonstrated. The average quantity of bottom fauna in Louisa Lake was 1.64 pounds per acre, dry weight, in August and 2.15 in October. Redrock Lake contained 2.73 pounds per acre in September and an estimated 3.28 pounds per acre in October. There was little difference in the amounts of bottom organisms at comparable depths between the two lakes at the same time of year. The

greater relative area of the highly productive 0- to 15-foot depth zone in Redrock Lake accounted for its larger average bottom fauna. The feeding of the lake trout upon the bottom fauna was also in proportion to the relative areas of shallow bottom in each lake.

(California) A Review of California's Progress in Fish and Game Conservation, 15 p., illus., printed. California Department of Fish and Game, Sacramento, Calif., September 1, 1953. A brief, factual report on the work of the Department of Fish and Game, and how it has dealt and is dealing with some of the many problems of fish and game conservation presented in the last few years. It does not pretend to be a complete report of the Department's progress, but to present briefly and objectively some of its work. The report describes the expansion of the Department during the last decade, and discusses, among other subjects, the development of new fisheries, research techniques, and cooperative research programs. The section on inland fisheries discusses trout hatchery expansion, the warm-water fish program, improvements in hatchery operations, trout investigations, stream improvement, the striped bass program, and the Dingell-Johnson catfish project.

(Canada) Fisheries Statistics of Canada, 1951 (Nova Scotia), 8 p., printed. French and English, 25 Canadian cents. Department of Trade and Commerce, Dominion Bureau of Statistics, Ottawa, Canada. Consists of tables giving the production and landed and marketed values of the principal species of fish and shellfish landed in Nova Scotia in 1949-51; quantity and value of manufactured fishery products for 1950-51; vessels used in the sea fisheries; capital equipment in the primary fisheries operations; and the number of persons engaged in the fisheries.

(Canada) 1950 Landings of Fresh Groundfish by Offshore Vessels at Nova Scotia Ports, by George Sullivan, Statistical Series No. 4, 8 p., illus., processed. Fisheries Research Board of Canada, Atlantic Biological Station, St. Andrews, N. B., October 1953. This circular, the fourth in a series, presents data for fresh groundfish landings by offshore vessels at Nova Scotia ports for the year 1950. Statistics of catch by species and size are recorded by months in relation to fishing method and fishing effort. Catch and effort statistics for part of the offshore fleet are listed by quarters in relation to area fished. Special reference is made to flounders with a graphic presentation of the long-term increase in total landings by all countries from the Gulf of St. Lawrence, Nova Scotia Banks, and Newfoundland Banks.

The Culture of Tilapia in Rice Paddies in Taiwan, by Tung-Pai Chen, Fisheries Series: No. 2, 32 p., illus., printed in English. Chinese-American Joint Commission on Rural Reconstruction, Taipei, Taiwan, August 1953. Describes the culture of Tilapia in certain countries and its introduction into Taiwan; habits of Tilapia mossambica; culture of fish in rice paddies; and methods of paddy culture of Tilapia.

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Also discusses experiments, extension, and evaluation of results of paddy culture of Tilapia in Taiwan in 1952.

Economic Values of Salmon and Steelhead Trout in Oregon Rivers, by Wesley C. Ballaine and Seymour Fiekowsky, 61 p., printed, \$1. School of Business Administration, University of Oregon, Eugene, Ore., August 1953. This publication covers the same subject as the publication entitled Economic Values of Anadromous Fishes in Oregon Rivers reviewed in the November 1953 issue of Commercial Fisheries Review. However, it covers that subject in much greater detail. The authors point out that the earlier report "was designed to answer, as specifically as possible, questions relating to the contributions to the economy of Oregon made by salmon and steelhead sport angling and by commercial fishing for these and other anadromous species." The writers believe that another treatment of the same study which would amplify the discussions relating to the techniques used and the economic analyses involved would be of value. Accordingly, they have written this bulletin which is a revision of the earlier report given to the interim committee. The factual data remain the same, but the emphasis has been shifted.

Estimates of the economic values to Oregon of the commercial and sport fisheries for anadromous fishes are again given, but in greater detail. As in the earlier publication, income or expenditure estimates are given. In this more detailed publication the authors also present some capitalized value data which are not given in the earlier report.

--W. H. Stolting

(Florida) Summary of Florida Commercial Marine Landings for 1952, by Irving J. Cohen and Billy F. Greer, 27 p., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., September 1953. A summary of Florida's marine fish and shellfish landings for 1952 by species and by counties. Also includes a summary and comparisons of the landings and ex-vessel value of fish and shellfish for Florida's east coast and west coast. In addition to marine landings, some landings of fresh-water catfish have been summarized, but this is only a small portion of the state's commercial catch of fresh-water species. Statistical summaries of fresh-water commercial fisheries may be obtained from the Florida Game and Fresh Water Fish Commission in Tallahassee.

International Fish Journal (For the Fish Industries and Trade), no. 1, September 1953, 32 p., illus., printed, in English and Spanish, D. Kr. 25 (US\$3.60) annual subscription. International Fish Journal, 6A Urtehaven, Copenhagen-Valby, Denmark. This is the first issue of a new magazine to be published bimonthly. The publishers state that the journal is issued "... with the thought to serve international interests and to be a connecting link between the fish industries and the fish trade of all countries of the world..." English and Spanish will be the languages regularly used, but articles, texts of advertisements,

etc., may occasionally be printed in any other language or languages desired. The first issue was sent to 80 countries and territories producing, exporting, and importing fishery products.

Marine Fouling and its Prevention, prepared for Bureau of Ships, Navy Department, by Woods Hole Oceanographic Institution (Contribution No. 580), 398 p., illus., printed. United States Naval Institute, Annapolis, Maryland, 1952. This well-illustrated report presents the results of investigations from 1940-1946. Periods of war have always increased interest in the prevention of fouling, especially on naval vessels. Fouling is the results of animal and plant growths on the submerged surfaces of objects. On ships it reduces speed, increases cost of fuel, and entails losses in time and money. It is also destructive and costly to buoys, mines, nets, piping, etc. Recent progress in development of antifouling paints by the Bureau of Ships has enabled vessels to remain at sea up to 18 months with practically no loss of efficiency and with no increased costs due to fouling, has decreased the fuel consumption of the fleet by 10 percent, reduced the number of tankers needed to service the fleet, and reduced corrosion on ship's hulls. The essential remedy is to prevent the growth of the organisms. Studies have revealed that about 2,000 species of plants and animals are involved in fouling. Barnacles, tunicates, hydroids, marine plants, and bryozoa are among the chief offenders. Water temperature seems to be the principal natural factor in the growth and reproduction of fouling species, which is seasonal in many parts of the world. The history of attempts to prevent fouling dates back to the fourth century B.C., when the ancient Phoenicians, Carthaginians, and Greeks, among others, used various liquids and compounds, and possibly copper, on their ship's bottoms. Lead sheathing was also an early preventive. However, it was not until the late 18th Century that copper sheathing became the first antifouling surface to receive general recognition and use. Introduction of iron-hulled ships necessitated the discontinuance of copper because of the corrosion of the iron by the copper, and eventually lead to the search for effective antifouling paints. Necessary qualities for effective antifouling paints include durability, adhesion, smoothness, and ease of application in addition to the ability to prevent attachment or growth of fouling organisms. Tests of antifouling paints are carried out in numerous field stations, as well as in the laboratory, and these techniques are described and illustrated. In addition to the chapters on the effects of fouling, the principal fouling organisms, the history of fouling prevention, the design of antifouling paints and their testing, the report contains an entire section on the biology of fouling, and chapters on such technical aspects as ship resistance, invention of protective devices, factors influencing attachment and adherence of fouling organisms, prevention of fouling with toxics, characteristics of antifouling coatings, fouling of metallic surfaces, and the interaction of antifouling paints and steel. The report should be of interest to vessel owners and operators, naval architects and engineers, paint

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manufacturers, and various individuals or groups involved in the upkeep of ships and other underwater surfaces.

--D. E. Powell

(Maryland) Summary of Maryland Laws Relating to Plants and Animals, by William H. Bayliff and Ruvell Stanis Morton, Bulletin 5, 40 p., illus., processed, 30 cents. Board of Natural Resources, State Office Bldg., Annapolis, Md., June 1, 1953. A brief summary of the laws which apply to plants, animals, and fish of Maryland, and the reason for each law. Describes specifically the laws which apply to fish in tidal waters, fish in non-tidal waters, oysters, clams, terrapin (turtles), and frogs.

(New Zealand) Marine Department Annual Report for the Year 1952-53, 53 p., printed. Marine Department, Wellington, New Zealand, 1953. The first section of this report covers New Zealand's registration of vessels; vessel survey data; a discussion of navigational aids and safety measures in New Zealand ports; and a statement on the inspection of boilers, lifts, and cranes. The second section covers New Zealand's fisheries for the calendar year 1952. Total production figures and comparative data are given by species and by port, including information on number of vessels and personnel, and methods of capture. Included are statistics on fish-liver oil production, whaling, oysters, toheroa (a marine bivalve), mussels, whitebait, and quinnat salmon. Fresh-water fisheries, fresh-water fishery research, marine fishery research, and foreign trade in fishery products are also reported upon.

"Poisonous Fishes and Fish Poisoning," by Bruce W. Halstead, article, Research Reviews, November 1953, pp. 23-25. Office of Naval Research, Department of the Navy, Washington, D. C. Poisonous fishes, widely distributed throughout all warm seas, are particularly numerous around certain island areas in the tropical Pacific. According to reports received from the Japanese, more than 400 of their military personnel succumbed to fish poisoning in Micronesia during World War II. It has been estimated that there are about 300 species of toxic fishes in the central Pacific Ocean. Among the total poisonous fish population of the world, this number is undoubtedly considerably higher.

Apparently fishes become toxic as a result of their feeding habits. Hence any reef or shore fish is potentially poisonous if captured in an endemic area. Fishes commonly found to be poisonous are such species as: red snapper, pompano, barracuda, surgeonfish, goatfish, moray eels, grouper, sea bass, puffers, triggerfish, trunkfish, etc. A commercially valuable species in one area may be deadly poisonous in another. Puffers (also known as globefish, swellfish, or blowfish) are usually extremely toxic. Ingestion of an ounce of the liver or flesh of some puffers has been known to kill a man within 17 to 20 minutes. In general, the visceral organs--the liver, intestines, and roe--of a fish are more likely to be toxic than the musculature and should never be eaten.

The chemical and pharmacological properties of most fish poisons are unknown. Puffer poison, in its purified state, is a white hygroscopic powder, readily soluble in water and insoluble in the ordinary organic solvents. The exact chemical structure and source of the poison are still unknown. Moreover, it is not known whether the poisons found in such fishes as snapper, grouper, moray eel, etc., are related to puffer poison, or whether they are a different compound.

Most fish poisons (exclusive of puffer poison) appear to have a composite physiological action on humans. Many of the symptoms are similar in nature to those produced by compounds such as aconitine, muscarine and curare. Whether or not ordinary fish toxins are true alkaloids remains to be seen. These fish toxins are water soluble and relatively heat stable. Ordinary cooking procedures do not destroy or appreciably alter the virulence of the poison. Also, the state of freshness of the fish has no bearing on the production or the virulence of the toxin, since putrefaction is not a contributing factor in this disease.

Native peoples have numerous methods by which they attempt to distinguish a poisonous fish from an edible one. Methods involving silver coins, color of fish, condition of the gills, position of the scales--and so on, ad infinitum--are based upon local superstition and not scientific fact. You cannot detect a poisonous fish by its appearance. Moreover, there is no known simple chemical test whereby you can determine the edibility of a fish. The most reliable methods involve the preparation of tissue extracts which are injected intraperitoneally into mice.

Proceedings of the Gulf and Caribbean Fisheries Institute, Fifth Annual Session, Miami Beach, November 1952, 174 p., illus., printed, \$1. The Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, Coral Gables, Fla., April 1953. Contains all of the papers presented at the fifth annual session of the Institute. At the Commercial Fisheries Session, the papers presented dealt with the outlook for the menhaden industry of the Atlantic Coast; an outline of the menhaden industry; some technological aspects of menhaden products; tomorrow's byproducts; "quality control" in the fisheries; and the economic effect of the importation of fishery products on U. S. standards. Papers for the Technology and Exploratory Fishing Session discussed exploratory fishing in Bermuda waters; shrimp exploration of the M/V Antillas; problems of exploitation of tuna in the Gulf and Caribbean; some practical aspects of electric fishing in the sea; holding fresh shrimp in refrigerated sea water; and practical aspects of shrimp freezing. Subjects of the papers presented at the Economic Session included: fisheries in the Netherlands Antilles; some preliminary observations relative to a study of the marketing problem of the Florida fisheries; survey of household consumer preferences for fish and shellfish with particular emphasis on the southern region; what determines fish prices and an approach to the

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problem; and the importance of the "exempt truck" to the fisheries industry. Papers for the Shellfisheries Session discussed bacteriological standards for oysters grown in a semitropical climate; importance of local environment in oyster growth; effects of dredging operations upon shell and shellfish; the vertical distribution of setting of oysters in North Carolina; some experiments in the production and transplanting of South Carolina seed oysters to certain waters of the Chesapeake area; quantitative measurement of effect on oysters of disease caused by "*Dermocystidium marinum*," distribution of oyster larvae in relation to hydrographic conditions; and present biological research on oysters. Subjects of the papers presented at the Caribbean and General Session included: a suggested reorganization of the Florida marine fisheries laws; distribution of fishery resources in relation to hydrographic conditions in North Carolina estuaries; computed ocean currents in the Gulf of Mexico; proposed new regulations for the northwest Florida mullet fishery; and a review of the Caribbean Fisheries Conference held in Trinidad in March 1952. The Summary of Sessions presents discussions on the problems of the commercial fishing industry; trends in exploratory fishing and technological research; and the emphasis in oyster research in past years. An appendix includes a brief review of the work of the Atlantic States Marine Fisheries Commission; activities of the Gulf States Marine Fisheries Commission for October 15, 1951-October 15, 1952; a summary of significant economic trends in the Gulf and Caribbean fisheries; and a summary of Caribbean and general sessions.

Rail Freight Rates and the Fish and Seafood Industry, by J. W. Bourke, 39 p., processed. Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C., October 1953. This publication contains detailed information about carload railroad freight rates for the transportation of fresh, frozen, and canned fishery products. It shows the rates for these products and can be used to form the basis of intensive study of the railroad carload freight-rate structure for these products. Various rate groups and mileage distances under which these products are shipped are shown. It also contains rates for other food products, such as eggs, cheese, poultry, meats, etc., with which the fresh, frozen, and canned fishery products rates can be compared.

The rates shown in the study are those prevailing on July 1, 1953, and include the full increase authorized by the Interstate Commerce Commission in Ex Parte Number 175 (Increased Freight Rates and Charges-1951). In addition, supplemental data with respect to records of receipts of fishery products at Chicago, Illinois, and New York, New York, by various modes of transport are shown. These data were taken from the U. S. Fish and Wildlife Service's Fishery Market News Service records. Population data from the Bureau of Census and Interstate Commerce Commission freight commodity statistics are also shown.

(Colony of Singapore) Report of the Fisheries Department, 1952, by T. W. Burdon, 95 p., illus., printed, British Malaya \$1 (approximately 30 U. S. cents). Government Publications Bureau, General Post Office, Fullerton Building, Singapore, 1953. Contains a general review of the fishing industry of Singapore during 1952. Discusses the availability of fresh fish; inventory of the fishing industry (number of fishermen, licensed fishing boats, details of power-propelled fishing boats, licensed fishing gear, and pond cultivation of fish); transportation and marketing; fresh-fish prices; prices of materials used to produce fishing gear; trade in salted and dried fish; and trade in other marine products.

A Study of the Lake Trout, SALVELINUS NAMAYCUSH, in Two Algonquin Park, Ontario, Lakes, by Nigel V. Martin, 27 p., illus., printed. (Reprint from Transactions of the American Fisheries Society, vol. 81 (1951), pp. 111-137.) Fisheries Research Section, Department of Lands and Forests, Southern Research Station, Maple, Ontario, 1952. A study was made of the depth distribution, feeding, and growth of the lake trout (*Salvelinus namaycush*) in Lake Louisa and Redrock Lake, Ontario, in 1947. In the spring the trout were widely dispersed in Redrock Lake but as surface waters warmed to 14° or 15° C. (57°-59° F.) in mid-June they moved into deeper waters. During the summer months the Redrock lake trout concentrated in the lower thermocline and upper hypolimnion while those in Lake Louisa were more widespread. Both populations frequently penetrated the 15- to 20-foot zone in mid-summer up to the 18° C. (64° F.) isotherm. In each lake the smaller trout had a deeper distribution. In both Redrock and Louisa the food was varied in the spring months. Insects, particularly the immature stages, were eaten extensively at this time. During the summer the Louisa trout fed on plankton as there was no other available food. The Redrock trout fed almost exclusively on the yellow perch, *Perca flavescens*, the distribution of these two species overlapping in the 12° to 18° C. (54°-64° F.) zone. In both lakes a large number of empty stomachs occurred in the early fall. Small trout ate more plankton and insects and less fish than did the larger trout. Food competition and cannibalism were of little importance. Lake Louisa trout grow more slowly than those in Redrock Lake. This difference is correlated with the difference in feeding habits. The Lake Louisa fish have a growth rate similar to other plankton-feeding populations in Algonquin Park while the Redrock trout have a growth like that of piscivorous populations. The lake trout of both lakes grow slowly as compared with many growth rates reported for the species. Maturity is reached at age V in both lakes. Variation in year class strength is evident in both Redrock and Louisa lakes.

The 1944 Year Class of Lake Trout in South Bay, Lake Huron, by F. E. J. Fry, 15 p., illus., printed. (Reprint from Transactions of the American Fisheries Society, vol. 82 (1952), pp. 178-192.) Fisheries Research Section, Department of Lands and Forests, Southern Re-

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search Station, Maple, Ontario, 1953. The 1944 year class of lake trout (Salvelinus namaycush) supported a significant sport fishery in South Bay, Manitoulin Island, during 1948 to 1950, inclusive, at a time when that species was absent in any numbers in adjoining Lake Huron. The evidence from tagging indicates that this population of lake trout in South Bay was a resident one. These trout reached a length of 20 inches and a weight of 4 pounds as age-group VI. Growth data based on scale reading are presented for age-groups II to VII and confirmed by observations on marked fish. Estimates of the size of the lake trout populations and of the survival of groups marked in different years were made by fin clipping and tagging through the years 1948 to 1951. The population was estimated to consist of some 21,000 fish in 1948 and to have fallen to 600 fish in 1951, the highest mortality rates coming after 1949. Only 3,124 lake trout were recorded as removed by angling during that period and it is believed that the creel census covered more than 90 percent of the fishery. It is suggested that the sea lamprey (Petromyzon marinus) was responsible for the death of most of the remainder of the population and evidence is presented to show that the incidence of scarred fish greatly increased in the years when the estimates of mortality were also high.

(Union of South Africa) Food Industries of South Africa Year Book and Buyer's Guide 1953, 183 p., illus., printed, £2 (US\$5.60). United Trade Press S.A. (Pty.) Limited, Ardis House, 16 Bree Street, Cape Town, South Africa, 1953. This is the first edition of the Food Industries Year Book. Articles of particular interest in this issue are: Technical Developments in the South African Canning Industry; Developments in the Technology of Food Manufacture; Spoilage in Canned Foods and Its Prevention; Dehydration and Quickfreezing for Food Preservation; and The Significance of pH in the Manufacture of Food. Also contains a report on scientific and industrial research in South Africa; a selection of mathematical, physical, chemical, and processing data used in the food industries; a section on the development of modern packaging in South Africa; and a buyer's guide. The buyer's guide gives brand names, a classified list of supplies, external trade representatives of the

Union, and addresses of various firms connected with the food industries. Fish canning, fish spoilage, the fishing industry, and fishery products, are mentioned in several sections although there is no one section devoted entirely to fishery products.

"A Whale-Marking Expedition," by N. A. Mackintosh, article, Nature, November 21, 1953, vol. 172, no. 4386, pp. 933-4, printed. Macmillan & Co., Ltd., St. Martin's Street, London, W. C. 2, England. Describes a whale-marking expedition in the Antarctic, organized jointly by the National Institute of Oceanography and the Norwegian State Institute for Whale Research. In the summer of 1953 a number of whaling companies (British, Norwegian, Dutch, and South African) agreed to share the cost of about a month's marking by the modern whale catcher Enern, owned by a Norwegian company. The Enern was expected to reach the edge of the pack-ice during the latter part of November, and to mark whales between the Greenwich meridian and South Georgia in the Dependencies of the Falkland Islands. The main object of this expedition is simply to increase the number of marked whales at large, and hence the number of marks recovered; but it is also intended to test the value of certain modifications to the standard "Discovery" mark, which have been devised to improve their effectiveness, and to estimate the chances of marks being overlooked when the carcasses are treated at the factories. "It is hoped," states the author, "that with improved efficiency in the recovery of marks, the ratio of marks recovered to marks fired will come nearer to the ratio of total whales killed to total whales in the population. The latter ratio is at present unknown, and it is naturally of great importance. Large numbers of recovered marks are needed, not only to make the ratio of recovered marks more significant but also for studies of migration, of the rate of dispersal or interchange between the populations of different regions, and of the age and rate of growth of whales. Of course, a single new marking voyage will not dispose of all these problems, but it is hoped that it will lead at least to some progress in the investigation of this interesting mammalian population and assist the work of the International Whaling Commission."



CRABS SHRINK QUICKLY DURING LIVE STORAGE

South African experiments have shown that crabs lose weight quickly during live storage, especially at high temperatures. The loss after 3 days at 15° C. (59° F.) was 25 to 32 percent, and after 4 days as much as 40 to 50 percent.

--World Fisheries Abstracts, March-April 1953.

FISHERIES OF THE UNITED STATES AND ALASKA, 1951

Fisheries of the United States and Alaska, 1951, C.F.S. No. 915, is a report on the surveys covering the 1951 catch of fish and shellfish in all areas except the Mississippi River and its tributaries. Data on the operating units were also collected in each of the areas canvassed, except in the Great Lakes States.

The catch of fishery products in all sections of the United States and Alaska during 1951 totaled approximately 4.4 billion pounds, valued at \$361 million to the fishermen. This represented a decrease of 10 percent in quantity, but an increase of 5 percent in value as compared with the landings of the previous year.

The following table, which contains recorded production for the areas in which surveys were made, and estimates for other regions, indicates the trend of the yield and value of the United States and Alaska catch during recent years.

Year	Pounds	Value to the fishermen	Average price per pound
1940	4,059,524,000	\$98,957,000	2.44¢
1941	4,900,000,000	129,000,000	2.63
1942	3,876,524,000	170,338,000	4.39
1943	4,202,000,000	204,000,000	4.85
1944	4,500,000,000	213,000,000	4.73
1945	4,575,500,000	269,900,000	5.90
1946	4,456,000,000	310,000,000	6.96
1947	4,344,000,000	307,600,000	7.08
1948	4,575,000,000	367,000,000	8.02
1949	4,796,000,000	339,000,000	7.06
1950	4,884,909,000	343,876,000	7.04
1951	4,414,045,000	360,996,000	8.18

Copies of C.F.S. No. 915 are available free upon request from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

DO YOU KNOW THAT:

In the commercial fisheries of the United States and Alaska, Pacific salmon are second only to tunas in economic value.

Salmon are rich in proteins, fats, and vitamins, and especially good for canning. Bulk of the catch is canned, though large quantities are sold on the fresh-fish markets, and considerable amounts are frozen, pickled, and smoked.

Adult salmon stop feeding when they enter fresh water. Stored fats provide sustenance for developing eggs and milt, and for energy for the upstream journey.

When salmon enter the rivers, their flesh is firm; when they are ready to spawn, the flesh is soft and undesirable.

Adult Pacific salmon can leap vertically 8 to 10 feet if water conditions are ideal, but such heights usually will block passage upstream.

For the sportsman, important salmon are the king or chinook and the silver or coho. They may be caught by trolling, spinning, or casting.

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Cover, pp. 1, 3, 4, 5, 6--Exploratory Fishing and Gear Development Section staff; p. 30--Les Frigoridores du Littoral, S. A., Brussels, Belgium; p. 41--T. Gorazdowski, Government Fisheries Officer, Hong Kong.

CANNED SALMON MILLION DOLLAR LENTEN CAMPAIGN

From late February to Easter Sunday housewives all over the country will be under a continuous barrage of messages on canned salmon. The program includes plans for at least one full-color page in the March issue of a leading woman's periodical, featuring a salmon casserole recipe. This recipe will also be featured from coast to coast on two major TV networks and on one major radio hook-up. All of this has been arranged by the canned salmon industry through its recently established industry-wide advertising organization--Canned Salmon Incorporated.

Several "promotion partners" will be joining with the salmon industry in featuring the recipe with emphasis on their own products. These partners will use all media--national magazines, daily and weekly newspapers, Sunday newspaper supplements, radio and TV women's programs, farm and regional magazines, and company house organs. The recipe, name, and objective will be the same in every promotion partner's work.

At the point of sale, over 400 men will work for 10 weeks to cover more than 100,000 Class A retail stores, building displays and putting up full-color point-of-sale material.

Altogether, Canned Salmon Incorporated estimates that over a million dollars will be spent through the Lenten period in this canned salmon promotional program.

The U. S. Fish and Wildlife Service in its home economics activities has prepared and published several tasty, economical, and attractive salmon recipes for use by housewives and institutional menu planners. Most popular for the school lunchroom has been the Salmon Loaf. The Service publication, How to Cook Salmon, TKS-4, features recipes for canapes, sandwiches, salads, loafs, casseroles, and chowders, all designed for the housewife. This latter publication is available from the Superintendent of Documents, Washington 25, D. C., for 15 cents each.

Simultaneous with the pre-Lenten salmon program the Service is releasing as its recipe of the month, a recipe for economical and delicious salmon loaf. Copies of this recipe are being distributed to the more than 800 home economists, food editors, and restaurant and institutional dieticians throughout the United States that have requested this regular recipe service.



SALMON SALAD